COLUMBIA RIVER POWER FOR THE PEOPLE

A History of Policies of the Bonneville Power Administration

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COLUMBIA RIVER POWER FOR THE PEOPLE

A History of Policies of the Bonneville Power Administration

DEDICATION

Give us men to match our river. Man harnessed the Columbia, and the River harnessed and developed man. Oldtimers who worked on Bonneville and Grand Coulee dams and early powerlines mention the spirit of enthusiasm, pride, and dedication to public service, and ask if that sense of devotion still prevails. They are proud of what they built and accomplished.

The best of all policies, and so essential in a public agency, is this strong sense of service in the public interest. President Kennedy said, "When you help build a region, you help build your Nation." About 100,000 men and women built the dams and powerlines to transmit the benefits to the people. Thousands more carry on the work at Bonneville Power Administration and a dozen sister agencies. To all these – this history is dedicated!

BPA

United States Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

High above the Continent the Columbia Icefield divides the water flowing to the three oceans, the Arctic, Atlantic, and Pacific. It is both a source and a major storage reservoir of the Columbia River. The ice mantle is two to three thousand feet thick, draped across the Canadian Rocky Mountains at the 9500-foot elevation, covering about 110 square miles. It is 200 miles north of the U.S. border and 40 miles east of Mica Dam.

Ray Atkeson photo

FOREWORD

This is a history of policy decisions – how they were made and how they were translated into action for the benefit of the people of the Pacific Northwest and the Nation. And, perhaps most importantly, it is about the people who made those decisions and why they made them.

My predecessor, Don Hodel, initiated the writing project, the late Bernard Goldhammer guided its early stages, and Gus Norwood researched and wrote the history with help from many persons. There is one error of omission I wish to correct: the author neglected to chronicle that he, himself, was one of those people who effectively influenced policy decisions during his pioneering service from 1947 to 1967 as the first executive secretary of the Northwest Public Power Association. Knowing that, you will better understand that this is not a safe and sanitized bureaucratic exercise. It is written from a perspective and a point of view.

The policies of the Bonneville Power Administration have been developed over more than four decades, now, growing out of the roots of the conservation movement and the concept of multiple purpose development of our nation's natural resources. At the heart of the policies has been the idea of benefitting people and spreading the benefits as widely as possible among the people. Today's strong policy direction toward conservation of energy is not at all inconsistent with those older policies.

We offer this history to readers and researchers as a reference, to help them understand present policies and programs, and as background for formulating new policies for the future.

People make policies and they make history. And by doing so they also help make the future. If this volume helps readers to envision better policies for the future, it will indeed serve a useful purpose.

Sterling Munro

Sterling Munro
Administrator

PREFACE

That Bonneville Power Administration exists at all is historically surprising. It came into being in 1937 on a temporary basis, pending establishment of what some hoped would be a Columbia Valley Authority patterned after the Tennessee Valley Authority. The near completion of Bonneville Dam construction necessitated a quick arrangement for selling the power. The Congress adopted the Bonneville Project Act as a stopgap, to create a "provisional" agency.

This is one explanation of why the Bonneville Power Administration (BPA) was created. Other impressions exist. For example, the BPA library has an official legislative history of the Bonneville Project Act of August 20, 1937, but of some 40 bills introduced starting on January 3, 1935, the legislative history treats only the last bill and its signing into law. The legislative history does not treat the alternatives considered, the issues debated, and the controversies; and thus is too limited.

Three other histories exist. In 1942 Lillian Davis, of the BPA library, assembled accounts from various sections of BPA covering the first five years. Her effort remains in rough draft. Again in 1944 Lillian Davis assembled drafts under the title *The Bonneville Power Administration and the War.* This work also is in draft form. Most recently Vera Springer prepared a compact history in response to a request from the American Public Works Association. Her work was published in 1977 with the title *Power and the Pacific Northwest.* These earlier writings proved helpful to the present effort.

In 1974 the incumbent Administrator Donald Paul Hodel requested a different kind of history. He asked: When and how did Bonneville's major policies originate? He envisioned a history of policies useful to the general public and specifically for people dealing with BPA, as well as for use by the staff. He noted the large exodus of retirees including top officers who knew why many policies were adopted.

The record verifies the basis for his concern. In the six years 1970 through 1975 BPA had 1093 separations; 575, or almost 100 per year left for retirement. In short, a whole generation of older employees was leaving. In contrast to the customary 30-year generation of mankind, the time cycle for a generation of top management is likely to be only 5 or 6 years.

With the passage of over four decades it appears appropriate to undertake a history of the policies of the Bonneville Power Administration, and to examine whether the policies have relevance to the future. The time has come to open the 1937 time capsule, so to speak, and also to think about the present-day capsule that another generation might open four decades hence. Energy planners often use 2020 and 2050 as target dates for long-term planning. How good will the present day planning prove to have been?

Administrator Hodel laid down two guidelines for the proposed history: First, follow the facts wherever they lead, or the history will not have credibility, and second, where appropriate and feasible, evaluate the policies for their relevance for the future.

As to the scope of the history, an important question arose about starting the history in 1937 with the Bonneville Act as passed, and going from there, or to go behind the Bonneville Act to search out the origins of the various policies of the Act.

The latter view was concurred in by the late Bernard Goldhammer, then Power Manager. His approach was adopted and he supervised the early stages of the historical research. In seven conferences prior to his retirement at the end of 1974, he approved three guidelines:

First, he urged the identification of BPA's major policies and the selection of representative, significant policies;

Second, he emphasized the need to trace each policy back to its genesis although some antedated the creation of BPA;

Third, he asked for a description of the setting and politics at the time each policy was adopted.

As it turned out, the historical settings became the basis for dividing the history into 10 parts as shown in the table of contents. The first part concerns the time before 1929; the second 1929-1934; and the third 1935-1937. Part four covers the start of BPA operations in 1938 and 1939. The next five parts deal with the subsequent four decades. The tenth and last part relates to the future.

The first chapter in each part describes the historical setting. Generally, a policy responded to the then current political climate.

The ten parts follow one another chronologically. Each chapter on a given policy or program also uses chronological order. Chapters appear so as to credit the policy to the historical period in which the policy was adopted.

The first three parts and perhaps the fourth part trace the earlier policies to their genesis. The background was provided as far as necessary to explain the situation. The conservation heritage comes from the previous century. The evolution of the Federal policy on internal improvements goes back even farther. These national policies and other factors had to evolve before the Federal Government could build its first dam. It required many more debates before the Congress resolved on how to handle the generation and marketing of electric energy. A slow evolution took place from the many decades of wasteful exploitation of resources to a national conservation policy. The chapter on the Conservation Learning Curve suggests much work and much research remain to be done to improve and refine the concepts of conservation. Conservation proves to be a fundamental thread that runs through the history as a positive continuity.

The history involves many themes. The title suggests a broad theme of Columbia River power for the people. The authority to build transmission facilities, the policies on widespread use, postage stamp rate, anti-monopoly, and preference all facilitated rural electrification, low rates, multiple purpose river development, and industrial and economic betterment. The transmission grid system, one of the Nation's largest, illustrates regionalism, a decentralized approach, and many technological achievements. The operation of the grid opened the door for power management services far beyond the mere marketing of Federally generated power. Finally BPA has evolved institutionally as a member of a pluralistic, regional electric system of public, cooperative, and private utilities, and large industrial customers, with major inter-regional and interagency relationships.

More than two thousand years ago the Greek historian Polybius declared that the purpose of history is not satisfied by mere narrative and chronology. He held that history can and should be instructive: that we should be able to learn from history. Most scholars have since approved of Polybius. Much more recently, in the last century, the nature of history has changed from preoccupation with kings, generals, wars, and dates, to a study of the underlying evolution of political, social, economic, and cultural forces. Today few subjects and few aspects of modern living escape the curiosity of historians. The history of BPA touches engineering, technology, research, public administration, construction, economics, accounting, business, regionalism, planning, and natural resources. A balanced, adequate and meaningful history involves all such areas. It must also serve the generalist.

A *policy history* must focus on policy and must address the question of "why?" What need gave rise to the policy? What caused the policy? Many definitions of policy exist. Commonly, policy is a guide for action; an intent to achieve a goal or objective. Professor Ira Sharkansky defines policy in government as the action itself: policy is the action from its inception to the completion of the program and its evaluation. The total action is the policy. Policy is viewed differently by individuals as opposed to governments. One is micro-policy, the other is macro-policy. The policy of the Bonneville Act is a cluster of policies, interrelated, interwoven, and mutually supportive. The Bonneville Act, the Columbia River development program, the treaty with Canada, the West Coast interties are examples of broad programs comprising many policies.

This history emphasizes election results. The BPA organization encompasses many skills, each important. The engineer may wish to shun politics. But every two years the Nation goes to the polls and adjusts the political climate in which the BPA organization lives and works. BPA must respond to need and to the political process. Policy arises from need and the political process expresses the need, whether formally or informally, clearly or vaguely, specifically or generally.

In writing this history many people have helped or provided encouragement. Information became available from many sources. Hector Durocher especially provided technical advice, and Russ Holt editorial review. The writer, of course, must be responsible. The references guide the reader to sources for further detail.

A final word about policy. No work was found to serve as a guide for preparing a formal policy history. Since about 1968 the field of policy has emerged in several graduate schools. They began offering masters degrees in public policy, policy analysis, and indeed policy science. Three academic journals on public policy are being published. Several dozen books exist on the nature of policy. Nonetheless the field is quite new.

The most important policy is the spirit and morale of the people who pioneered the development of the Columbia River and formulated the plans to transmit the benefits to the public. Many people had the vision, the sense of mission, and dedication to public service. Many retirees talked about the spirit of BPA. They were happy in what they had helped build. John Baldino had started with BPA in 1938 in a survey crew, retiring in 1976 after serving as deputy administrator. At his retirement luncheon he said this: "I feel like only yesterday I got into a Model T Ford and now

I'm getting off a Boeing 747." The spirit of dedication and pride of workmanship must surely be the most understated aspect of this history.

Finally, the Nation faces an uncertain future with respect to energy. Energy has become more dear. Public concern has increased. Scarcity of fuels and rising prices are sharpening national awareness of the importance of energy for modern living, and it is a worldwide issue. In the Pacific Northwest the people expect Bonneville Power Administration to be on their side and to do something about energy. This awareness and concern is part of what lies behind the title, "Columbia River Power For The People."

Gus Norwood

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Part One Before 1929

CONSERVATION HERITAGE

1. Where Rolls the Oregon
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1. WHERE ROLLS THE OREGON

What do we want with the vast, worthless area? This region of savages and wild beasts, of deserts, of shifting sands and whirlwinds of dust, of cactus and prairie dogs – to what use could we ever hope to put these great deserts and these endless mountain ranges, impenetrable and covered to their base with eternal snow? What can we ever hope to do with the west coast, a coast of 3,000 miles rock-bound, cheerless and uninviting, and not a harbor in it? What use have we for such a country?

Mr. President, I will never vote one cent from the Public Treasury to place the Pacific Coast one inch nearer to Boston than it is now.

– Senator Daniel Webster
of Massachusetts 1840.

Geography influences history. This is particularly evident in the Pacific Northwest. Powerful geologic forces shaped the earth and changed its weather. Geography gave this land scenic beauty and habitability. Geographic remoteness, however, hindered discovery and exploration of the region and the Columbia River, once called the Oregon. Many other geographic factors delayed settlement and economic development.

The Pacific Northwest is part of the newest large geographical addition to North America, and the newest major continental uplift on Earth. Prior to this uplift, the ancient Pacific Ocean shoreline followed the present line of the Rocky Mountain western foothills, except for a peninsula projecting westward to the Blue Mountains of Oregon, and 300 miles off the coast an island in the Siskiyou-Klamath area. The rest of what was to become the Pacific Northwest was a shallow submarine shelf.

According to the theory of drifting continental plates, the Pacific Ocean plate began grinding against the North American plate about 300 million years ago, uplifting offshore submarine areas. Lyman called it "a land of old upheaven from the abyss." The first uplift occurred during the Mesozoic Era of geologic time, a period of 230 million years. Much of western North America and central United States consisted of shallow seas. The ancestral Rocky Mountains began rising about 305 million years ago, reached completion in 5 to 10 million years, and eroded away in the next 40 million years. They had disappeared by about 260 million years ago.

Their sediments accumulated in the inland seas to a thickness of several thousand feet, resulting in much marshland. The warm climate and tropical growth supported a large variety of animals, including the dinosaurs which dominated the life of the world for about 130 million years from 190 million years ago to 60 million years ago.

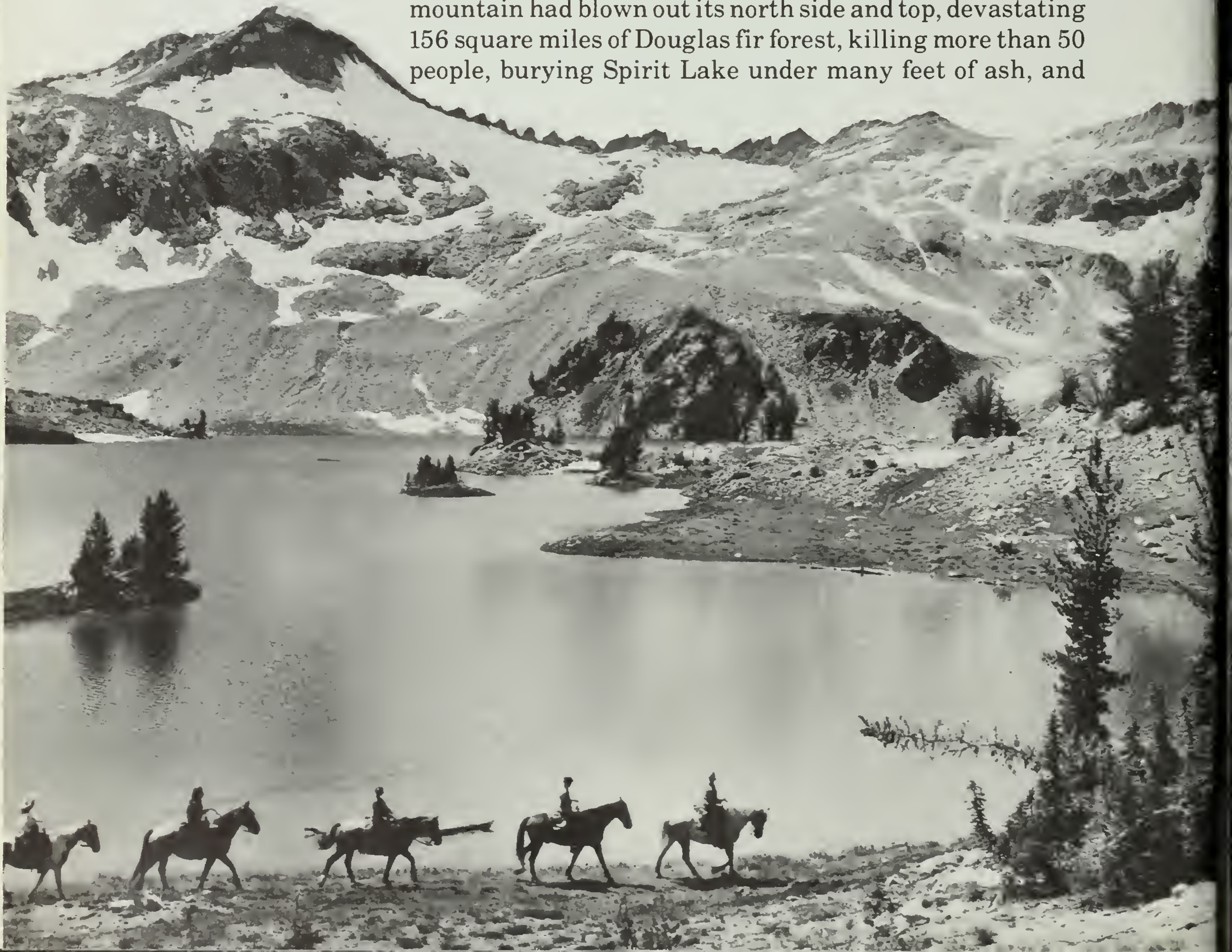
Celilo Falls forced Lewis and Clark to make a portage in 1805 and again in 1806, dragging the heavy dugout canoes over the ground. Their diaries noted all such obstructions to navigation and commerce. The Indian fishing platforms at Celilo as well as the falls have disappeared under the placid waters of the reservoir behind The Dalles Dam.

Ray Atkeson photo

The uplift resumed the last 70 million years or Cenozoic Era. The extinction of the dinosaurs probably resulted from the rising of the second Rocky Mountains — marking the beginning of the second major uplift. The new Rockies were formed about 72 to 43 million years ago, followed much more recently by the Cascades and the Coast Range.

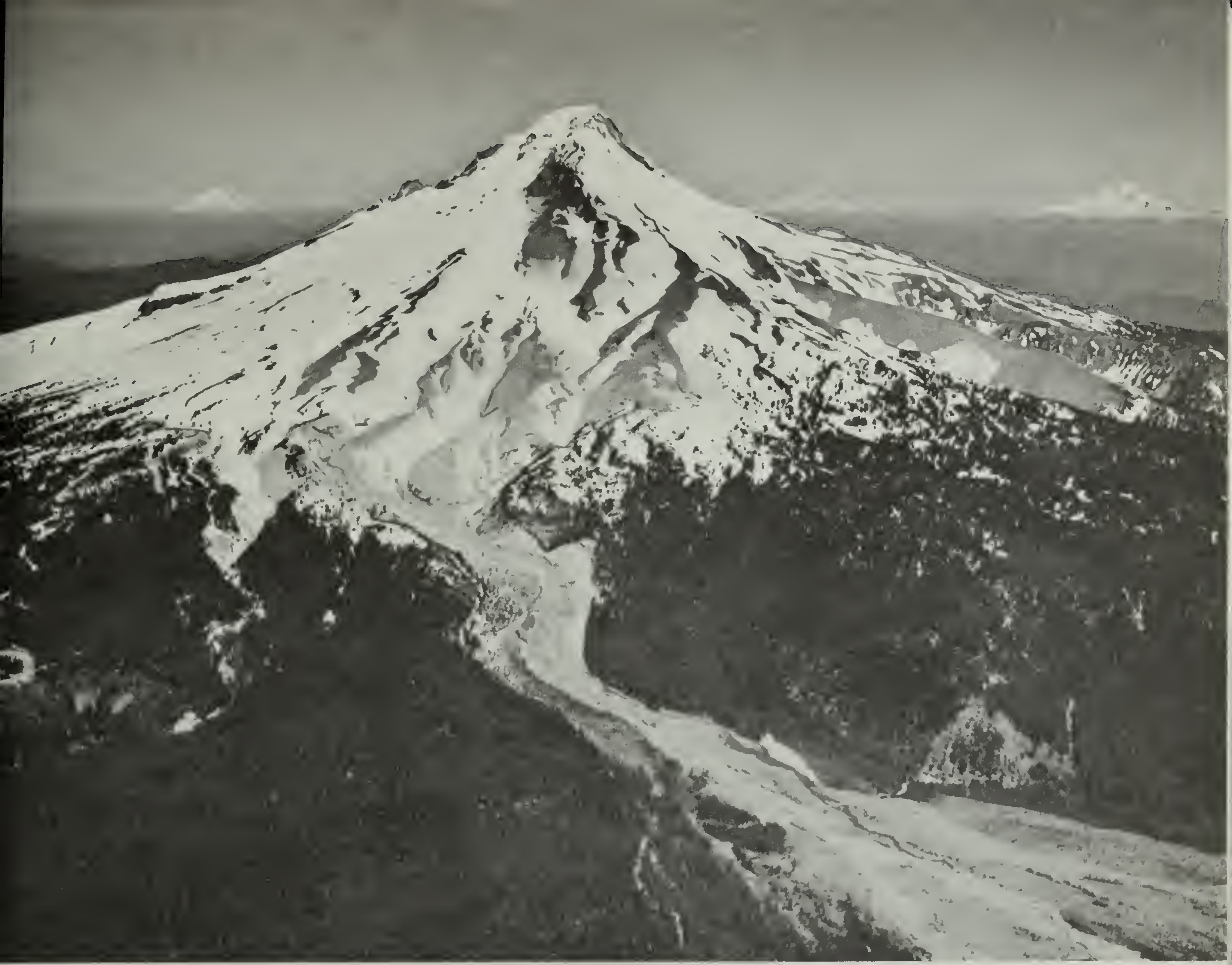
Heat created by pressure between the plates about 15 million years ago brought on the fire age. Lava flowed from long fissures in the Wallowa Mountains and along the line which later became the Cascade Mountains. It spread over 250,000 square miles in successive layers 10 to 40 feet thick, building to depths of 5,000 feet. The volcanoes of the Cascade Mountains appeared in the last few million years and many of the present cones were formed within the last 100,000 years. One collapsed only 6,600 years ago, Mount Mazama in Oregon, which now is topped by Crater Lake.

Mount Saint Helens, youngest of the Cascade volcanoes, is mentioned in the Indian legends as a beautiful maiden and alternatively an old hag. Now we know what the Indians meant. On May 18, 1980, the 9,677-foot cone, beautiful, symmetrical, and with a glistening mantle of snow, changed abruptly to a nondescript, barren rocky hump, torn open by a huge crater on its northern slope. The mountain had blown out its north side and top, devastating 156 square miles of Douglas fir forest, killing more than 50 people, burying Spirit Lake under many feet of ash, and



The sources of the Columbia River cover 259,000 square miles and elevations up to 14,408 feet above sea level. Wallowa Lake is shown below nestled in the ancient Wallowa Mountains of eastern Oregon.

Ray Atkeson photo



reducing the mountain's elevation to about 8,400 feet. Almost a cubic mile of ash, from this and subsequent eruptions, choked the Toutle and Cowlitz Rivers, which in turn passed much of the mud into the Columbia. High altitude ash fell on Yakima and across eastern Washington, and some in northwestern Oregon, including Portland. Traces of ash appeared across the country to the Atlantic. Early damage estimates exceeded a billion dollars.

The Cascade Mountains created a dike landlocking several large inland seas. Although the Cascades were repeatedly eroded and rebuilt, they continued to intercept the westerly winds, capturing much of the moisture. The inland lakes dried up. The land turned into desert.

Then came an ice age. For at least a million years ice covered as much as one-fourth of the earth's land surface, reaching a depth of 10,000 feet in Canada. Glaciation lowered the oceans by 250 feet. River channels extended further into the ocean, 20 miles in the case of the Columbia River. The ice oscillated, repeatedly receding and advancing every 10 or 20 thousand years, particularly at the continental ice margins as in British Columbia and northern Washington. The land bridge in the shallow Bering Sea

The view looking north at Mount Hood in Oregon also shows on the horizon Mount St. Helens, Mount Rainier and Mount Adams, left to right, all in Washington.

Ray Atkeson photo

permitted animals and humans to migrate from Asia to North America via the Yukon River Valley and to penetrate southwards when the ice receded enough to permit travel.

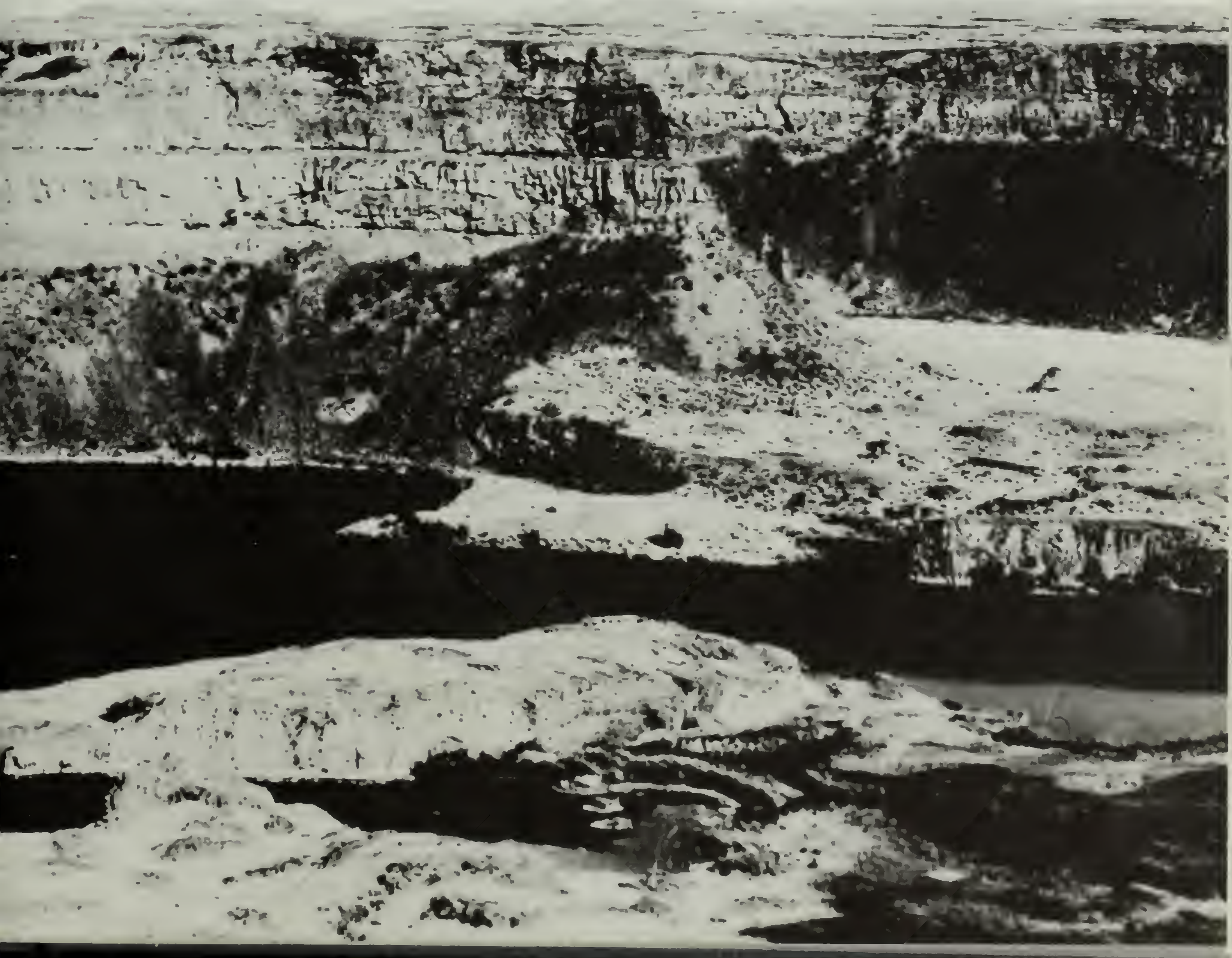
Melting glaciers brought on floods. The last glacial age had blanketed northern Washington, Idaho, and Montana. An ice lobe across Pend Oreille Lake in Idaho to the Bitterroot Range dammed Missoula Lake, covering 3,000 square miles with water up to 2,000 feet deep. Another lobe blocked the Columbia River, raised its level, and diverted the water through Grand Coulee and over Dry Falls.

From time to time the ice dam holding Missoula Lake failed and released the lake's entire contents of some 500 cubic miles of water in 2 or 3 days. Geologists tell us that the last great flood occurred 18,000 to 20,000 years ago. It sent water down the Spokane River Valley at some 45 miles an hour, and across eastern Washington to Wallula Gap on the Columbia River. This and earlier floods created the scablands of eastern Washington. Another major channel continued to carve out Grand Coulee and erode Dry Falls. Thus, the powerful, and usually simultaneous, forces of uplift, fire, ice, and flood, combined with erosion and sedimentation, created the physical Pacific Northwest.

Steamboat Rock appears in the small picture looking south down the 30-mile long Grand Coulee in north central Washington. As recently as 20,000 years ago a huge glacier blocked the Columbia River and raised its waters 300 feet above the top of the present day Grand Coulee Dam. The overflow carved out the Grand Coulee.

The Land. The resulting land was mostly mountainous and uninviting, interrupted by barren deserts, then more mountains, and bordered to the ocean by thick forests. The Pacific Northwest includes the states of Washington, Oregon, Idaho, and western Montana. The 10,000-foot Rocky Mountain peaks mark the Continental Divide. From the rooftree of the continent the region slopes westward to the Pacific Ocean. Down this slope flow the waters that make up the Columbia River.

The eastern part of the Pacific Northwest features steep mountains, rugged foothills, and precipitous canyons, including the nation's deepest — the Hells Canyon of the



The large picture looking northward shows Dry Falls at the lower end of Grand Coulee. Here the raging glacial torrent as large as 20 Columbia Rivers crashed into the plunge pools shown in the picture.

Snake River. The mountain streams provide the headwaters of the Columbia River and its major eastern tributaries, the Kootenai, Clark Fork, and Snake Rivers. The Columbia and Kootenai, however, rise in Canada. The eastern zone includes three national parks, Glacier, Yellowstone, and Grand Teton, and extensive wilderness, scenic, and recreational areas.

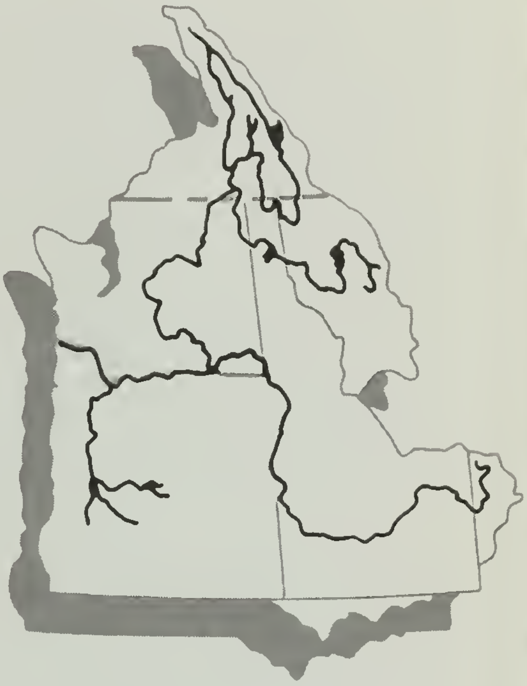
The central zone extends eastward from the Cascade Mountains about 200 miles, and 500 miles north and south. It comprises the relatively flat lava plateau at elevations from 1,000 to 4,000 feet above sea level. When irrigated the well-weathered basalt supports an extensive agriculture.

The Cascade Mountains, averaging about 40 miles wide in Oregon and 80 miles wide in northern Washington, reach from Canada to California. The range extends 100 miles into California to Lassen Peak and 50 miles into Canada to Mount Garibaldi. The Cascades in Oregon and Washington includes three national parks, Rainier, North Cascade, and Crater Lake, and many wilderness and recreation areas. Fifteen snow-covered volcanic peaks, some girded with glaciers, make the Cascade Mountains a wonderland of America. The Cascades divide the region between the moderate weather of the humid coastal strip and the dry continental climate to the east.

The hundred mile wide maritime strip reaches from the Pacific Ocean to the Cascades. The maritime climate results from the moderating influence of the Japanese Current cooling the coast in summer and warming it in winter. The coastal zone, south of the Olympic Mountains, provides for a prosperous agriculture and lush forests of fir, hemlock and cedar. Over half of the region's 7 million people live here, mainly in or near Seattle and Portland. The Willamette and Cowlitz are major tributaries of the Columbia.

The Water. The Columbia River watershed generally coincides with the boundaries of the Pacific Northwest. The Columbia River serves as the main factor in unifying and defining the region and constitutes the outstanding natural resource of the region. Of the 259,000 square miles in the Columbia River basin, 39,500 or 15% of the area lies in Canada. Except for the coastal streams of Washington and Oregon, the Columbia River drains the entire region.

Its average annual discharge of 180 million acre-feet makes the Columbia the fourth largest river in North America, after the Mississippi, Mackenzie, and St. Lawrence. Originating in Columbia Lake in British Columbia at 2,650 feet elevation the Columbia flows 1,210 miles to the Pacific Ocean. The drop of two feet per mile is four times as steep as the Mississippi which falls about 600 feet in some 1,200 miles. Within the U.S. the Columbia drops 1,284 feet from the Canada border for the 748 miles to the Ocean. Most of the precipitation in the mountainous eastern part of the region falls in the form of snow during the long winters. Some of the snow packs down as glaciers forming the large ice fields in Canada. Summer heat melts the snow and ice to create the annual Columbia River flood in May and June. The low natural flow in winter can be as small as three percent of the summer flood peak. Despite the extreme vagaries in flow, the Columbia is the outstanding water power resource of North America.



Major tributaries of the Columbia.

Man. Humans have existed in this area at least 15,000 years. A half dozen archaeological sites in the Pacific Northwest date back to 10,000 to 15,000 years ago. Many Indians had inhabited the region, especially along the lower Columbia River. Epidemics in 1780 and 1829-1830, particularly the latter, wiped out about 90 percent of those in the lower Columbia River tribes. The decimation of the Indian population made easier the later entry of white settlers.

Captain Robert Gray of Boston entered the Columbia River on May 11, 1792, after he and others narrowly missed the Columbia many times. His feat came 300 years after Columbus reached America. It came in large part because of the long search for the Northwest Passage as a better route from Europe to India.

When the Turks captured Constantinople in 1453, cutting off the caravan overland route between Europe and the Orient, the search began for an alternate route. Henry the Navigator (1394-1460), son of King John I of Portugal, launched the age of exploration by sending ships southward down the west coast of Africa. His ships found and Portugal colonized the Azores and Madeiras, and in 1445 he reached Cape Verde. His work in navigation stimulated others. Bartholomeu Diaz reached the Cape of Good Hope in 1488. Then six years after Columbus landed in the West Indies, Vasco da Gama of Portugal rounded the Cape of Good Hope and reached India in 1498.

The Portuguese and the English surmised that America was a barrier to a westward approach to India. As early as 1497 John and Sebastian Cabot sailed from England to look for the Northwest Passage. Portugal sent Corterreal, and he failed to return. In 1513 the Spaniard Balboa saw the Pacific and claimed for Spain all the lands bordering the Pacific Ocean. Ferdinand Magellan of Portugal sailed around the world 1519-1522. The Spaniards and English

redoubled their efforts. In 1543 the Spaniards Cabrillo and Ferrelo saw the coast of Oregon. Searching for the Northwest Passage in 1577 Sir Frances Drake saw the coast of Oregon and Vancouver Island. Juan de Fuca allegedly sailed the Strait of Juan de Fuca in 1592. Aquilar of Spain tried to enter the Columbia in 1602, and named it Rio de Aquilar. Shakespeare, Jonathan Swift and others wrote about the River of the West or Rio de Aquilar. Soon navigators of several nations joined the search. History interfered as European kingdoms plunged into a series of wars that lasted more than 150 years, beginning with the Thirty Years' War (1618-1648).

Sailing for Russia in 1741, Vitus Bering discovered Alaska and laid the basis for Russia's fur trade with China. In 1745 the British Government offered 20,000 pounds for discovery of the Northwest Passage. The first Russian shipload of fur reached China in 1771. The Spaniard Heceta tried to enter the Columbia in 1772, and Perez, another Spaniard, reached Queen Charlotte Island and Nootka harbor on Vancouver Island in 1774. Other Spanish navigators notably Malaspina in 1791 touched the coast as far north as Mount St. Elias on the Alaska-Canada border. Captain Cook missed the Columbia River and the Strait of Juan de Fuca in 1778-79 but his ships took furs from Nootka to China. His voyage triggered the dramatic upsurge in fur trade and exploration of the 1780s.

Flying a Portuguese flag, the Englishman Meares lay off the Columbia on July 5, 1788, but wisely feared the breakers at the bar. He erroneously concluded no river existed there. The same year, John Kendrick and Robert Gray sailed to Nootka to trade for furs to exchange for spices and silks in China to sell back in Boston, a 3-year round-the-world trip. On their next trip in 1791-1793, with Gray commanding the Columbia and Kendrick the Lady Washington, they reached and tried for 9 days to enter the Columbia River. Continuing northward they met Captain Vancouver, who had sighted the Columbia River on April 27, 1792, but, based on the earlier report by Meares, concluded it was not a river. After this meeting, Gray returned south. On a favorable sea May 11, 1792 he sailed the Columbia over the bar and some 35 miles up the broad channel of the river and took on furs. He named the river Columbia after his ship and on May 20, 1792 put to sea northward. His exploration in time became part of the basis for the United States claim to the entire Pacific Northwest.

Again Gray met Captain Vancouver and reported his discovery. The disappointed Vancouver later sent Captain

Broughton in the Chatham to enter the Columbia River, which he did October 21, 1792. He explored the river as far as Washougal until November 10, 1792, and then rejoined Captain Vancouver at Monterey, California. Vancouver thereupon claimed the Columbia River for Great Britain. However, the British claim on the area came mainly by land and not by sea.

Lewis and Clark. Thirteen years after Robert Gray crossed the dangerous Columbia River bar, the Lewis and Clark Expedition in 1805-6 wintered at Astoria, Oregon. As early as 1783 Thomas Jefferson had advocated sending an exploration party to the Pacific Ocean. As President in 1803, while negotiations continued on the Louisiana Purchase, Jefferson obtained approval of Congress for sending an expedition, and selected his personal secretary Meriwether Lewis, then 29, as leader. Lewis in turn, with the President's approval, selected his friend and fellow Virginian, William Clark as coequal leader. Clark had had more experience with Indians and wilderness conditions. He was four years older and had commanded the rifle company with which Lewis had served. The expedition left the Wood River in Illinois on May 14, 1804, and returned from the 8,000 mile journey September 23, 1806.

Jefferson's June 20, 1803 letter instructed Lewis, in effect, to find a route most like the long sought Northwest Passage:

Meriwether Lewis on the right and William Clark on the left.

"The object of your mission is to explore the Missouri river, & such principal stream of it, as, by its course & communication with the waters of the Pacific Ocean, may offer the most direct and practical water communication across this continent, for the purpose of commerce."

Lewis and Clark in August 1805 crossed the Bitterroot Range of the Rocky Mountains at Lolo Pass, built dugout canoes, and descended the Clearwater, Snake, and Columbia rivers reaching the Pacific Ocean late in November. They identified 39 Indian tribes totaling 80,000 people, and observed their use of the Columbia River for navigation, trade, and as a source of fish. Particularly they noted the rapids and falls which hindered navigation. They made laborious portages around Celilo Falls and the Cascades. Located in the Columbia River Gorge at the city of Cascade Locks, Oregon, the Cascades presented a formidable challenge. Returning April 12, 1806 the party lost to the churning waters its largest dugout canoe and towrope.

The Lewis and Clark Journals began the record which led to building Bonneville Dam to drown the dangerous Cascades, The Dalles Dam to permit river traffic over

Celilo Falls, and six more dams to extend barge navigation to Lewiston, Idaho. The Cascade Mountains were named after the Cascades — after the Columbia River Gorge rapids which no longer exist.

The Lewis and Clark Expedition showed the way. The mountain men and trappers followed and located the Oregon Trail to The Dalles, but this still required going through the Columbia River Gorge. Thousands of settlers came to claim the Pacific Northwest for the United States. Meanwhile the Hudson's Bay Company in 1825 established Fort Vancouver on the Columbia River, now Vancouver, Washington, but the Company's stand was short-lived. The 1846 treaty made the Pacific Northwest part of the United States.

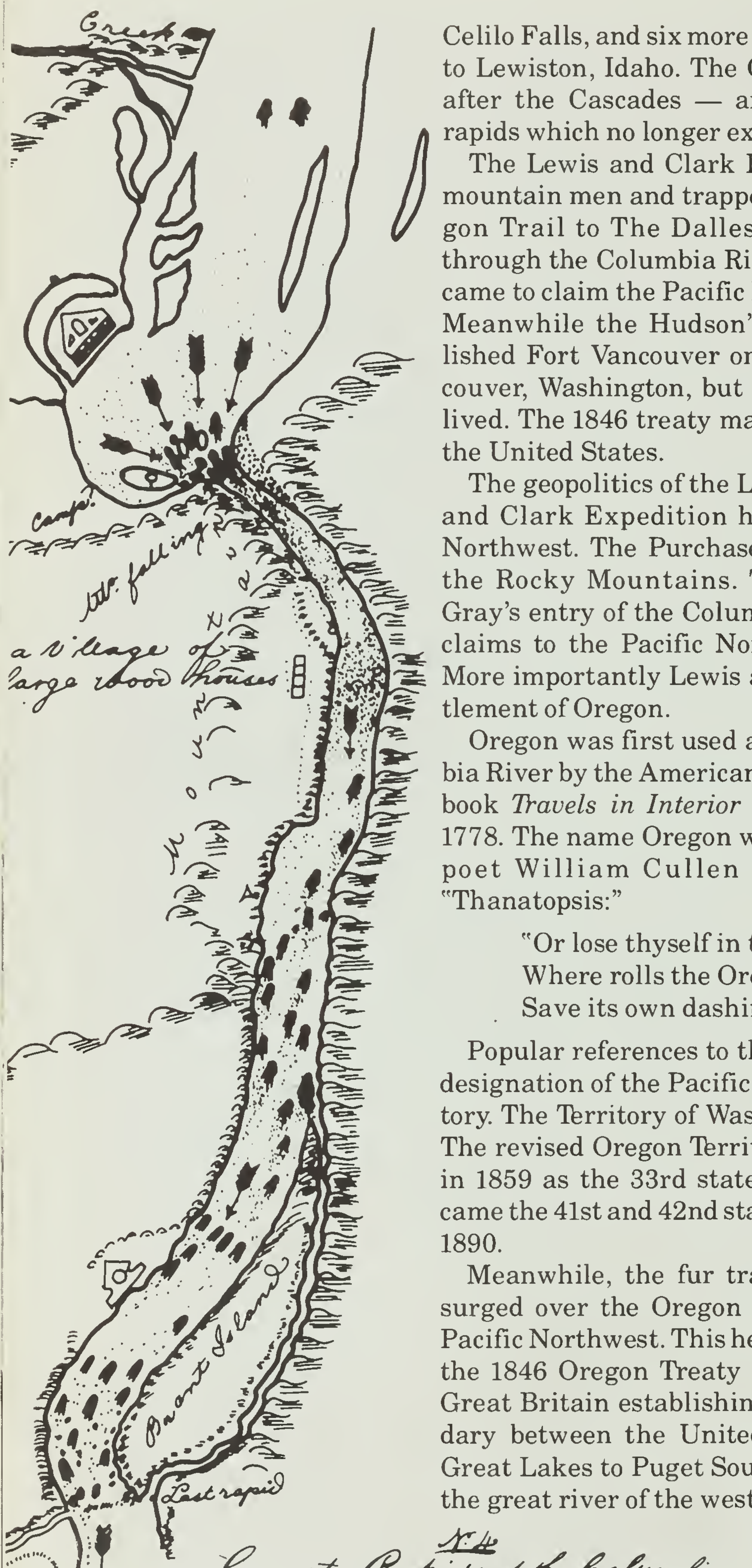
The geopolitics of the Lousiana Purchase and the Lewis and Clark Expedition had significance for the Pacific Northwest. The Purchase extended the United States to the Rocky Mountains. The Expedition together with Gray's entry of the Columbia River helped establish U.S. claims to the Pacific Northwest on ground of discovery. More importantly Lewis and Clark paved the way for settlement of Oregon.

Oregon was first used as a name to identify the Columbia River by the American traveler Jonathan Carver in his book *Travels in Interior Parts of America,* published in 1778. The name Oregon was popularized by the American poet William Cullen Bryant in 1817 in his poem "Thanatopsis:"

> "Or lose thyself in the continuous woods
> Where rolls the Oregon, and hears no sound
> Save its own dashings."

Popular references to the Oregon country led in 1848 to designation of the Pacific Northwest as The Oregon Territory. The Territory of Washingon was established in 1853. The revised Oregon Territory became the State of Oregon in 1859 as the 33rd state, Montana and Washington became the 41st and 42nd states in 1889 and Idaho the 43rd in 1890.

Meanwhile, the fur trade had declined. Pioneers had surged over the Oregon Trail in the 1840s to settle the Pacific Northwest. This helped provide the groundswell for the 1846 Oregon Treaty between the United States and Great Britain establishing the 49th parallel as the boundary between the United States and Canada from the Great Lakes to Puget Sound. The Treaty twice referred to the great river of the west as the Columbia.

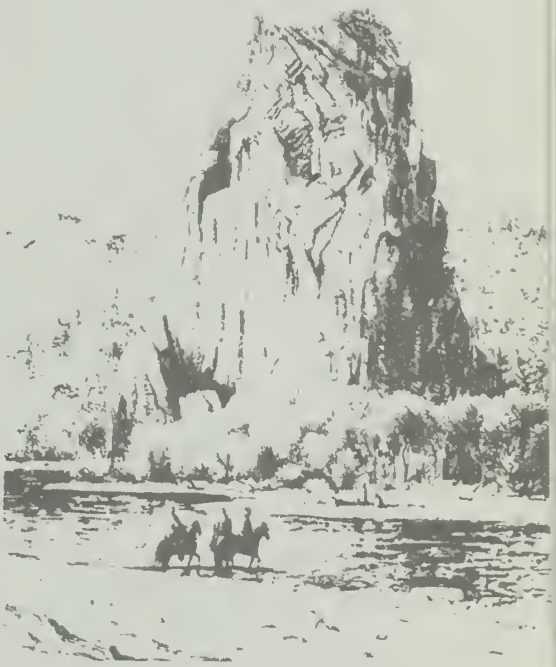


William Clark's map of the Cascades in the Columbia River Gorge is an example of his highly accurate maps. This map was redrawn for greater clarity.

The Economy. The Pacific Northwest economy developed along four lines of extractive industries — fishing, mining, forestry, and agriculture. All were characterized by seasonal employment, boom and bust, and sensitivity to economic depressions.

More recent history of the Columbia River Basin includes installation of railroads from 1870 to 1914, cattle and sheep raising attempts, and many efforts to overcome Columbia River Gorge rapids by portage trams, roads, railroads, river boats, and the Cascade Locks. Attempts in the 1880's to farm semiarid and arid areas of eastern Washington, eastern Oregon and southern Idaho led to a strong desire for irrigation. Many farming efforts were aborted because of lack of water.

Navigation was the initial motivation for planning Columbia River development. In time the narrow interest in the Columbia River for navigation broadened to include use of its water for irrigation of arid lands. The navigation motive led to the building of Bonneville Dam, and the raising of the 48-mile long reservoir on February 20, 1938 to drown out the Cascades. The irrigation motive brought the construction of Grand Coulee Dam. Meanwhile, even before John Wesley Powell's pioneering Arid Lands Report of 1878, there occurred an event presaging a new technology and the Age of Electricity.



Beacon Rock, so named by Lewis and Clark in 1805, was for a time known as Castle Rock and Pyramid until the original name was restored. It stands at the head of tidal influence of the Columbia.

Electricity. It was the birth of the Electric Age. With the dimming of the gas lights the vast crowd stood in near darkness that first night at Philadelphia's 1876 Centennial Exposition. Suddenly from high overhead, like a continuous flash of lightning, came a brilliant white light, turning night into day. The electric arc light was the showpiece of the world's fair.

In the next quarter century succeeding world fairs featured the progress of electricity. Edison patented the light bulb in 1879 and energized the Pearl Street Station in New York City in 1882, selling electricity at 25 cents per kilowatthour for luxury lighting.

By 1885 the famous French writer Emile Zola caught the vision of electricity and expressed his prophecy that:

"The day will come when electricity will be for everyone as the waters of the rivers and the winds of heaven. It should not merely be supplied, but lavished, that men may use it at their will as the air they breathe."

In Chicago in 1893, the Columbian Exposition's imitation white marble buildings and reflecting lagoons provided a dazzling impression, glittering and shining with the brilliance of thousands of electric lights.

At the Great Exposition in Paris in 1900, as he stood in the Gallery of Machines, a new revelation came to historian Henry Adams. He looked with awe at the huge electric dynamo. He tells of this in his remarkable autobiography, *The Education of Henry Adams.*

He saw in the electric dynamo the foundation for what he called a new social physics, a dynamic law of history and social change, the law of acceleration. He cited the doubling in the use of coal each decade from 1840 to 1900. He did not live long enough to witness the doubling each decade in the use of electricity, nor the many other doubling rates of growth in the 20th Century. But he had sensed and recorded the quickening of change.

Today many people question whether such doubling in electric use each decade continues to be necessary. In the past three quarters of a century the vision of Emile Zola and the revelation of Henry Adams have come to pass. Other writers likened electricity to the magic lantern of Ala-ed-din of the Arabian Nights. Books appeared on the wonders of electricity. Electricity gave birth to the multiplying effects of computers, electronics, the air and space ages, instant worldwide communications, cybernetics, industrial automation, and home conveniences.

Historically the growth of the Pacific Northwest coincided with the Electric Age. From the 1880 census of a mere 321,653 people, the population of the four Pacific Northwest states increased 22-fold to seven million. In the century just past, the region and electricity grew up together, and electricity was both a cause and a result of the growth.

Both regionally within the Pacific Northwest and nationally the new electrical technology presented many decades of challenges for engineering and economics. As a restive public sought to share the potential benefits, it also challenged political leadership and social institutions. Monopolization, profiteering, high rates, and poor service, or no service at all, brought on wave after wave of political debate in the U.S. Congress.

Now we have new debates. In the Pacific Northwest the electric public utility responsibility was for a long time met almost exclusively by harnessing water power — a renewable resource. The next phase was to add thermal power resources based on coal and nuclear fuel. As the need for more power supplies increased, the direction of policy turned to energy conservation and toward all available forms of renewable resources, but as yet the results have been slow and the outlook is for shortages.

2. THE CONSERVATION HERITAGE

Every stream should be used to its utmost. No stream can be so used unless such use is planned in advance. When such plans are made, we shall find that, instead of interfering, one use can often be made to assist another. Each river system from its headwaters in the forest to its mouth on the coast, is a single unit and should be treated as such.

–President Theodore Roosevelt
in transmitting preliminary report
of the Inland Waterways Commission
to the Congress 1908.

Rarely has a new idea had more historical impact, and widespread ramifications, particularly on Pacific Northwest development, than the conservation movement.

In the 130-year span from Thomas Jefferson's 1803 Louisiana Purchase to the Franklin D. Roosevelt inauguration several strands of history evolved to lay the foundation for the large public work projects started in 1933 on the Columbia River. These historical threads are intertwined to make up the nation's conservation heritage.

The adoption of a positive conservation policy with Federal financing of major public works required a substantial about face for the United States. Typical of the attitude of the founding fathers, Presidents Jefferson, Madison, and Monroe gave the U.S. Constitution a strict interpretation which severely limited the role of the Federal Government so that no public work could be built except lighthouses, in aid of commerce, and roads, forts and arsenals for defense.

The original 13 states generally held the Federal Government should undertake no functions other than those expressly delegated by the Constitution. The 10th Amendment of the Bill of Rights made this clear. The original States and the Southern Bloc held the voting power in Congress, so the Constitution was strictly interpreted. Debate on broad versus strict interpretation of the Constitution continued for more than a hundred years, slowly shifting to broader interpretation, as evidenced in the political party platforms.

No U.S. political party wrote a platform until 1840. That year the Democratic Party issued a one-page platform of nine short resolutions strongly advocating states' rights. For example:

"Resolved, that the constitution does not confer upon the general government the power to commence and carry out, a general system of internal improvements."

The party repeated the identical language in the platforms of 1844, 1848, 1852, and 1856. Party platforms reflect

Quieting the unruly waters. Upper picture shows the Cascades in the Columbia River Gorge. The City of Cascade Locks is located just to the right of the picture. Lower picture shows a barge plying the serene waters at Rowena Point after completion of Bonneville Dam.

Ray Atkeson photos

the changing mood and attitude of the country. Republicans held the White House 40 of the 52 years between 1860 and 1912. Democratic Party platforms became more liberal toward public works the longer Democrats were not in power. It took the Democrats from 1840 to 1904 to shift from opposition to internal improvements to support. Beginning in 1912, both parties continually supported development and conservation of natural resources.

Another important historical thread is the long, gradual shift of political power. As new states joined the Union and the population center moved westward from Baltimore to St. Louis, the control of Congress moved from the original 13 States to the 37 new States. Increased western representation resulted in the establishment of congressional committees interested in western problems and strong western membership on the committees.

MARCH 3, 1849

Congress created the U.S. Department of the Interior (USDI) on March 3, 1849 as the first new Federal department in 51 years. The Department became associated with the needs of the Western States and developed an influential voice on western issues. The Department pioneered much of the conservation movement. Later it established bureaus — the U.S. Geological Survey, Bureau of Reclamation, National Park Service, and many others — to institutionalize, develop, and carry out numerous conservation ideas and policies. In the New Deal period, USDI played a strong role in the public works program and assumed responsibilities for marketing electricity from most Federal hydroelectric projects.

Two amendments to the Constitution facilitated acceptance of a Federal role in public works. The 16th amendment adopted February 25, 1913 provided for a Federal income tax as a source of revenue for the Federal Government. The 17th amendment adopted May 21, 1913 provided for direct election of Senators, thereby making the U.S. Senate more responsive to the public.

The initial concern about conservation arose in regard to good farming land available for new settlers. For almost 300 years the pattern of American settlement had involved cutting and burning the trees, farming the land until it lost its fertility, pulling up stakes, and moving westward. After the Civil War, mining, forest, and land corporations moved in to acquire the public domain, often by marching temporary employees and illiterate Chinese coolies to land offices to file on homesteads which the same day became corporation property, contrary to the intent of the Homestead Act of 1862. John Muir and others called for setting aside public lands by creation of forest reserves and na-

tional parks. Moreover, as John Wesley Powell suggested, the assumptions and rules that might fit the humid, prairie states did not apply to the western half of the United States, where irrigation was needed.

The American frontier was closing rapidly. The waves of immigration peaked at 8,795,386 in the 1901-1910 decade, and totaled more than 46 million from 1820-1973. Many thousands reached the high, semiarid plains under false mottos like "The rains follow the plow." Many died, and many were driven away by the dust storms, as early as the 1880s and as recently as the 1930s.

The conservation movement arose in the late 19th Century out of an awareness that the frontier was closing and that resources were not limitless. Particularly in the western states the settler shifted his thinking from land to water as the limiting factor. Water then presented the challenge for engineering, for management, and for government.

Each generation of conservation leaders has stood on the shoulders of the previous generation. The Theodore Roosevelt Administration drew on the people and ideas of John Wesley Powell's time. They pioneered and advocated much of the conservation heritage and helped launch the scientific approach, government institutions, and private societies to implement conservation. Franklin D. Roosevelt emulated both his famous cousin Theodore Roosevelt and Chief Forester Gifford Pinchot — later a fellow governor.

John Wesley Powell and friend, a Piaute Indian of a small Shoshonean Tribe of southwestern Utah.

John Wesley Powell. John Wesley Powell interrelated conservation, a scientific approach, and planning particularly to the arid and semiarid states. In 1868, Powell, who had lost his arm in the Civil War, led parties up Pikes Peak and Longs Peak in Colorado. In 1869 he organized and led a daring exploration down the Green and Colorado Rivers which brought him to national attention. In the next decade, with support from Congress and the Smithsonian Institution, he made himself the authority on the geology and Indian tribes of the Colorado River Basin, an area long shown on the maps as "unexplored."

He founded the Bureau of Ethnology at the Smithsonian Institution in 1879 and served as its director until his death in 1902. During this period, he issued some 225 publications, including his own writing on the classification of Indian languages.

Also in 1879 he succeeded in his campaign to have the various national land surveys consolidated into one, thus establishing the U.S. Geological Survey (USGS). From

1881 to 1894 he was the second director of USGS, directing two bureaus simultaneously.

A man of many talents, an innovator, and a pioneer in many intellectual endeavors, Powell was administrator, geologist, linguist, regional planner, pioneer conservationist, and an advocate for science in government. He organized and outlined concepts for the Bureau of Reclamation and Bureau of Mines.

His 1878 *Report on the Lands of the Arid Region of the United States,* was hailed by Bernard DeVoto long afterwards as "one of the most remarkable books ever written by an American." The report led to a survey by USGS of irrigable lands and in 1902 to the establishment of the Reclamation Service. In his long struggle to label the high plains as semiarid (under 20 inches of rain), he was at least once forced to change his language to semihumid because the land promoters considered "semiarid" derogatory.

Theodore Roosevelt. One man who understood what Powell was saying about conservation was Theodore Roosevelt. He had tried his hand at ranching on the Little Missouri River in western North Dakota. In his first annual message to Congress December 3, 1901, Theodore Roosevelt called for Federal construction of reservoirs in arid regions to store water for useful purposes, instead of letting it flow unchecked to create floods. The Reclamation Act of 1902 established the Reclamation Service as a division of the U.S. Geological Survey. In 1907 it became the Bureau of Reclamation, which ultimately built Grand Coulee Dam and many other projects. In 1904 the Reclamation Service launched the Yakima project in Washington State and the Minidoka project in Idaho. Year after year Roosevelt reported to Congress on reclamation of arid areas by irrigation.

By Theodore Roosevelt's time the conservation heritage had progressed to the concept of planning development of a river basin as one unit, on a multiple purpose basis. Implementation would take some time.

On March 4, 1903, President Roosevelt sent Congress his Muscle Shoals veto message. The Rainy River Dam veto followed on April 13, 1908, and the James River veto January 15, 1909. All three messages involved proposed private hydroelectric power development. The President felt such projects should be licensed for a limited number of years and be subject to annual charges. The Muscle Shoals veto saved the proposed dam site for Federal development and creation of TVA. The other two veto messages led to the Federal Water Power Act of 1920.

Conspirators of the conservation movement. Chief Forester Gifford Pinchot is telling a tall story to President Theodore Roosevelt on a Mississippi River steamer in 1907 during a meeting of the Inland Waterways Commission.

Roosevelt approved legislation February 1, 1905 to establish the U.S. Forest Service in the Department of Agriculture with Gifford Pinchot as Chief Forester. He established a number of conservation commissions, usually with Gifford Pinchot as secretary. Roosevelt called the first Governors' Conference at the White House May 13-15, 1908, using conservation as the theme. He told the 44 governors and some 500 invited guests:

"The occasion for this meeting lies in the fact that the natural resources of the country are in danger of exhaustion if we permit old wasteful methods of exploiting them longer to continue..."

The conference and the nationwide publicity launched and dramatized the conservation movement. The proceedings contain some names which provide the next clue in tracing the conservation heritage. The conference recording secretary was Dr. W. J. McGee, longtime protege of John Wesley Powell. Elwood Mead and F. H. Newell, early Bureau of Reclamation leaders, also had served with Powell. The attendance list reads like a Who's Who of the conservation movement at that time.

Franklin Roosevelt. When Franklin Delano Roosevelt, at age 28, was elected to the New York State Senate in 1910, he became chairman of the Senate Forest, Fish and Game Committee, until then a minor committee. He put what he learned about forestry to use in initiating an extensive program to reforest the family estate at Hyde Park by planting several thousand tree seedlings per year.

He invited Pinchot to address the New York Legislature in 1912 on forest conservation. Pinchot did so with telling effect using two lantern slides. One showed a painting of a heavily forested, green valley in China with a logging chute visible in one corner. The other slide was a photograph 500 years later of the barren, lifeless gully. Roosevelt became a believer and made conservation an important part of his political philosophy.

Franklin Roosevelt's stand on the forestry issue soon earned him the hostility of big lumber companies. When he supported a bill authorizing the State of New York to build hydroelectric plants, he quickly felt pressure from utility corporations as well.

The more Roosevelt examined conservation problems, the more he saw the need for planning to conserve natural resources and for state conducted programs. His views were bolstered by his uncle, Frederic A. Delano, an outstanding city planner. In 1912 Delano showed him his new

Sources of the Columbia River include thousands of waterfalls. Top picture looks west over the Shoshone Falls in a spectacular gorge near the City of Twin Falls, Idaho. Bottom picture is Kootenai Falls on the Kootenai River in western Montana.

Ray Atkeson photos

city plan for Chicago, giving Roosevelt some understanding of the need for city planning. It also spurred him to think about planning to conserve human resources. Roosevelt recognized that government intervention in the economy would be needed to protect the public interest.

Reelected to the state senate in 1912, Roosevelt instead became Assistant Secretary of the U.S. Navy in 1913. As a candidate for U.S. vice president in 1920, he included a campaign swing through the Pacific Northwest, which he later often mentioned because he had caught a glimpse of the promise of Columbia River development.

In the 1928 Republican landslide for Herbert Hoover, one of the few bright spots for the Democrats was Roosevelt's election as governor of New York. He was reelected in 1930. In 1931 he won public support for a state constitutional amendment authorizing the purchase of abandoned farms and marginal lands for reforestation. He used the program to provide urgently needed jobs, a forerunner of the Civilian Conservation Corps (CCC) idea which he applied nationally in 1933.

As governor from 1929 to 1933 he had ample opportunity to reaffirm and expand his belief in conservation and planning particularly in regard to hydroelectric power. His January 1, 1929 inaugural address focused on one simple theme: water power belonged to the people and should be publicly developed. On April 27, 1931 he signed the Act which created the New York State Power Authority. He promptly assembled a strong staff of power experts and planners. One consultant was J. D. Ross of Seattle City Light. He often conferred with Republican Governor Gifford Pinchot of Pennsylvania, who was active in the electric power issue.

Indeed Franklin D. Roosevelt had been a keen observer and at times an active participant in the development of the electric power issue throughout his adult life. Moreover, as a lawyer, he was well grounded in public utility law. Mainly he had followed the activity of his older cousin President Theodore Roosevelt and friend Gifford Pinchot.

The harnessing of falling water fascinated Franklin Roosevelt notably because of New York State interest in the large hydroelectric potentials of Niagara Falls and incident to the long-proposed St. Lawrence seaway and power project.

3. TOWARD A NATIONAL POWER POLICY

We are now at the beginning of great development of water power. ...Already the evils of monopoly are becoming manifest; already the experience of the past shows the necessity of caution in making unrestricted grants of this great power.

–Theodore Roosevelt
Rainy River Veto Message
April 13, 1908

From time immemorial man has schemed against the idleness of falling water. Primitive water wheels originated in Rome in the first century B.C. The Vitruvian Mill or Roman Mill was a vertical wheel, undershot system. England had 5,264 water mills in the year 1085-1086 as listed in the *Doomsday Book,* the Grand Survey or Great Inquest ordered by William I (William the Conqueror).

Early American colonists brought with them knowledge for building dams to raise river levels, diversion works to channel water, and waterwheels to drive grist mills and sawmills. Private water powered mills were under colonial and later state regulation. Larger water power sites permitted construction of sizable textile mills. An alarmed British Parliament prohibited the export of water power machinery from England in 1700 to prevent the colonies from becoming a competitive threat in the textile market.

The interest in water power received new impetus with the birth of the Electrical Age in 1882. Private developers combed the country for water power sites, and the Congress generously passed special private acts granting water power rights in perpetuity.

Water power became a national issue during the 1901-1909 Administration of President Theodore Roosevelt. Soon after its establishment February 1, 1905 in the Department of Agriculture, the U.S. Forest Service published the *Use Book.* It set standards and fees for such things as permits for water power development in a national forest. Chief Forester Gifford Pinchot successfully defended his standards and charges nine times before the U.S. Supreme Court.

The Forest Service standards for water power permits were the basis for Theodore Roosevelt's veto messages and other recommendations to Congress for nationwide application for licensing hydroelectric projects. The General Dam Acts of 1906 and 1910 asserted Federal jurisdiction over water power on navigable rivers. On March 14, 1907 the first Roosevelt created the Inland Waterways Commission and on February 26, 1908 transmitted its preliminary report to Congress. A notable conservation document, it asserted that streams were assets of the people, warned of the dangers of monopoly, and called for the development of each river basin as a unit on a multiple purpose basis.

Meanwhile, from 1898 to 1909 the national forests expanded from 20 million acres to 193 million acres. This included many water power sites.

In his 1926 book, *Federal Water Power Legislation,* Dr. Jerome G. Kerwin traces the legislative history and other steps leading to enactment of the Federal Water Power Act of June 10, 1920, which created the Federal Power Commission. He writes that in the "great 15-year struggle for water power legislation" between 1905 and 1920, private electric utility corporations bitterly opposed Federal control of water power. They argued supremacy of states' rights. The House and Senate repeatedly debated the alleged constitutional issues.

Kerwin gives much credit for passage of the Act to a small band of conservation leaders, generally led by Pinchot, who aroused the public to the danger of water power monopolization. After leaving the U.S. Forest Service January 7, 1910, and until he became Pennsylvania governor in 1923, Pinchot used his position as president of the National Conservation Association to make his views known in the national capital.

Monopoly. It should be made clear, however, that Pinchot was not an advocate of public power, nor was Theodore Roosevelt who was mainly for conservation and against monopoly.

Evidence of monopolization mounted rapidly. In 1909 the U.S. Bureau of Corporations published data that 13 groups controlled one-third of the nation's commercial water power. In his autobiography, Theodore Roosevelt credited the Bureau with exposing the monopolization trend to which he referred in his next and more militant veto message of January 15, 1909, regarding a power site on the James River:

"1. The bill gives to the grantee a valuable privilege which is monopolistic and does not contain conditions essential to protect the public.

* * * *

"6. The people of the country are threatened by a monopoly far more powerful — because in closer touch with their domestic life — than anything known to experience.

* * * *

"9. The great corporations are acting with foresight, singleness of purpose and vigor to control the water powers of the country. They pay no attention to state boundaries and are not interested in the constitutional law affecting navigable streams except as it affords what has been aptly called a 'twilight zone' from any regulation.

* * * *

"12. I esteem it my duty to use every endeavor to prevent the growing monopoly, the most threatening which has ever appeared from being fastened upon the people of this nation."

By 1912 the Bureau reported ten groups controlled three-fifths of the commercial water power, a sharp incline toward monopolization. In response to a Senate Resolution, Secretary of Agriculture David F. Houston on December 20, 1915 submitted a three-volume report on electric utilities to the Senate. The report showed that 18 companies owned 348 water power plants or 51.1 percent of the nation's developed water power. It revealed many methods of control through directorships, holding companies, or banking, engineering, and construction affiliates. O. C. Merrill, Forest Service chief engineer, had prepared the report. He became the first secretary of the Federal Power Commission in 1920.

In February 1925 two events provided impetus to the move to investigate monopolization. On February 17, 1925, Pennsylvania Governor Pinchot delivered a ringing message submitting the Giant Power Survey Board report to the Commonwealth of Pennsylvania General Assembly. He warned of the dangers of the electric utility monopoly.

Also in that month, the U.S. Senate adopted a resolution sponsored by Senator George W. Norris of Nebraska requesting the Federal Trade Commission to investigate the extent of monopolization in the electric utility industry. The resulting report by the FTC in 1927 so incensed Senator Thomas J. Walsh of Montana, who called it a whitewash report, that he delivered a major speech February 28, 1927 in the Senate charging the utilities with violating the Sherman Anti-Trust Act. His list of 1,500 utility mergers in 1925 and 1926 filled 11 pages of the Congressional Record. His demand for a Senate investigation caused the utilities concern because he had chaired the committee which had successfully exposed the Teapot Dome scandal of President Warren Harding's Administration. This scandal was first unearthed by a newspaperman, Clinton Anderson, who later became a U.S. Senator.

After the November 1926 elections, the Senate refused to seat Frank L. Smith of Illinois and William S. Vare of Pennsylvania because they received massive campaign contributions from utility corporations. Smith, a former Illinois Commerce Commission chairman, allegedly received more than $300,000 in campaign contributions from Samuel Insull, head of a Chicago-based public utility holding company. Insull's attempt to purchase a seat in the United States Senate badly tarnished his image and that of electric utility corporations. A brief collapse in the value of utility holding company securities in early 1926 also caused some alarm about the political activities of the utilities.

Holding Companies. Senator Walsh reintroduced his request for a Senate investigation early in 1928 as Senate Resolution No. 83. After it was crippled by amendments, the resolution was adopted February 15, 1928. It authorized the Federal Trade Commission to investigate public utility holding companies and their propaganda activities and directed FTC to report monthly to the Senate.

The investigation was of special interest to the people of the Pacific Northwest and their political leaders, including Montana Senators Thomas J. Walsh and Burton K. Wheeler, because virtually all private electric utilities in the region had fallen into the control of eastern holding companies, thus they were called "absentee owned."

Over the next 6 years, major revelations were made concerning propaganda activities, unfair attacks on municipally owned electric systems, corruption of legislatures and public officials, financial manipulation, and neglect of operating utility companies. Publicity was widespread in newspapers, magazines and books.

The revelations laid the foundation for introduction of the Public Utility Holding Company Act as the Wheeler-Rayburn bill February 6, 1935. It sparked a lobbying and propaganda campaign of such dimensions that both houses of Congress promptly conducted lobbying investigations which unmasked and offset the campaign of the utilities. President Franklin Roosevelt signed the Act on August 26, 1935. It was a major New Deal victory. Under the Act, the Securities and Exchange Commission has nearly eliminated excessive pyramiding and other improper practices of holding companies.

Muscle Shoals. Another vehicle for debating the national electric power issue was the Muscle Shoals controversy. Muscle Shoals is a 37-mile stretch of the Tennessee River that drops 134 feet over a geological dip. In 1824 Secretary of War John C. Calhoun recommended construction of a canal and locks to bypass the rapids. Two successive canals did not solve the problem. In 1903 Theodore Roosevelt vetoed a bill for private electric development of Muscle Shoals. The National Defense Act of June 3, 1916, authorized a power dam to provide electricity for production of nitrates for munitions. On February 25, 1918, President Woodrow Wilson authorized construction of Wilson Dam, completed in 1925, which eliminated 15.5 miles of rapids. Later TVA built Wheeler Dam to finish bypassing Muscle Shoals.

On July 8, 1921 Henry Ford offered to take over the Government facilities at Muscle Shoals on the Tennessee River. On April 10, 1922 U.S. Senator George W. Norris of Nebraska introduced a bill for a counterproposal to create a government corporation to operate the facilities and continue development of the Tennessee River. During the next 11 years Muscle Shoals was the focal point for the water power fight. In 1928 and 1931 Presidents Calvin Coolidge and Herbert Hoover vetoed bills providing for public operation of the Muscle Shoals facilities. Finally, on May 18, 1933 President Franklin D. Roosevelt signed the bill which created the Tennessee Valley Authority.

The story of the many conflicts in the long struggle for TVA appears in Judson King's 1959 book *The Conservation Fight – From Theodore Roosevelt to the Tennessee Valley Authority.* King had worked closely with Senator Norris and others in the TVA and other power issue conflicts. For all its 45 years from 1913 to 1958, King directed the National Popular Government League established by a Committee of Fifty headed by Norris and Pinchot. Despite the League's broad objectives, the water power issue dominated the agenda. This indicates the reality and continuity of the power struggle during the 1913-1958 period. Many times King sounded the tocsin and rallied the troops for another skirmish.

National water power policy was developed amid turbulence. The conservation movement provided leadership; the fear of monopoly, incentive. The Federal Water Power Act of 1920, later named the Federal Power Act, settled the issue of states rights and Federal jurisdiction.

The Boulder Canyon Project (Hoover Dam) was the only large construction project in the early depression years. Thus, it became a symbol of engineering achievement, a source of national pride, and a precedent that helped launch a whole era of dam building.

Legislation prompted by the Muscle Shoals project set a precedent. In the Pacific Northwest the Bonneville and Grand Coulee projects vied for the position of being the first to be built.

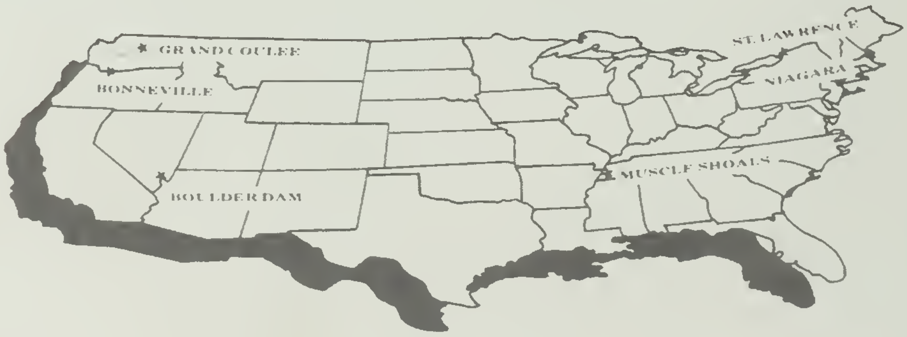
The Great Depression provided impetus for the nation to embark on an extensive public works program. Much of the foundation was thus laid for a surge of progress to harness America's rivers.

Campaign Promise. In his presidential campaign speech September 21, 1932, New York Governor Franklin D. Roosevelt made a significant promise to the overflow crowd at the Portland, Oregon municipal auditorium. He spoke of electric power development as a national problem. He criticized practices of electric utility holding companies. He called for better regulation of private utilities, and upheld the right of the people to establish public power systems. Then he addressed the subject of Columbia River development.

"We have, as all of you in this section of the country know, the vast possibilities of power development on the Columbia River. (applause) And I state, in definite and certain terms that the next great hydroelectric development to be undertaken by the Federal Government must be that on the Columbia River. (prolonged applause)

"This vast water power can be of incalculable value to this whole section of the country. It means cheap manufacturing production, economy and comfort on the farm, and in the household. Your problem with regard to this great power is similar to our problem in the State of New York with regard to power development of the St. Lawrence River.

"Here you have the clear picture of four great government power developments in the United States — the St. Lawrence River in the Northeast, Muscle Shoals in the Southeast, the Boulder Dam project in the Southwest, and finally, but by no means the least of them, the Columbia River in the Northwest. (applause) And from there, my friends, in each of the four corners of the United States, there will exist forever a national yardstick to prevent extortion against the public and to encourage the wider use of that servant of the American people — electric power."



This was a political campaign promise thoroughly carried out. During his 12 years as President, Roosevelt endowed the nation with a substantial national power program, including the enactment of five major laws in 1933 through 1937: the Tennessee Valley Authority Act of 1933, the Securities and Exchange Act of 1934, the Public Utility Act of 1935, the Rural Electrification Act of 1936, and the Bonneville Project Act of August 20, 1937. These five laws outlined a major change in national policy. They constituted a mid-course correction, indeed a turning point, in the Nation's handling of the electric power opportunity. After 50 years of a laissez faire or hands off attitude, the Congress declared the furnishing of electric service to be a public utility responsibility affected with a public interest. The Federal Government made a basic shift from a passive role to an active approach. In 1944, at Roosevelt's recommendation, Congress extended the principles of the Bonneville Project Act into a nationwide power policy in the Flood Control Act of 1944. Throughout his years in office he obtained authorization of dams and appropriations for power dams and transmission lines. He advanced the power program, particularly in the Pacific Northwest, to the point where each succeeding president has been able to build on it.

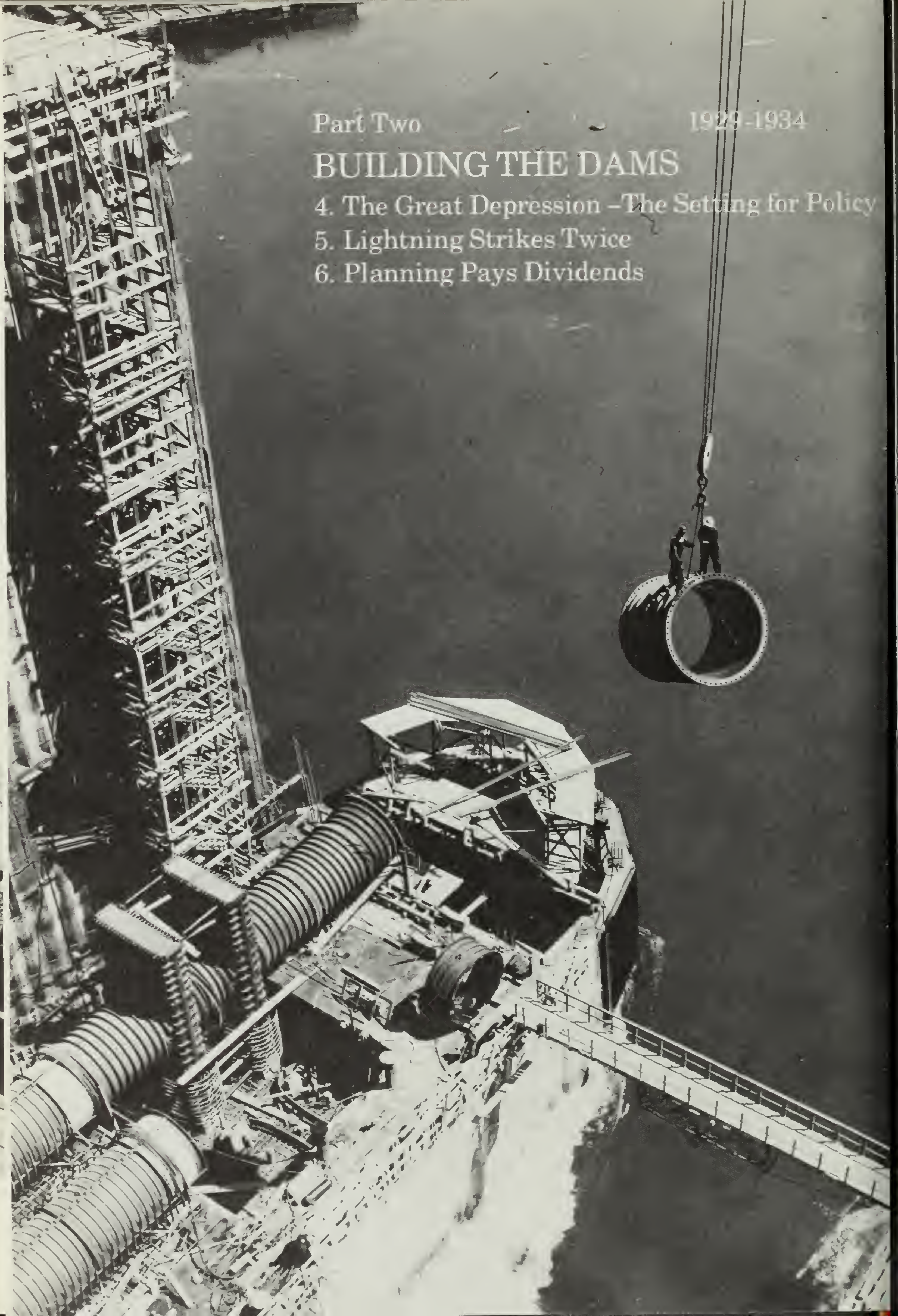
Snow is the biggest upstream storage reservoir of Columbia River water. The picture is in southern Idaho against the Teton Range.

Ray Atkeson photo

Part Two 1929-1934

BUILDING THE DAMS

4. The Great Depression –The Setting for Policy
5. Lightning Strikes Twice
6. Planning Pays Dividends



4. THE GREAT DEPRESSION – THE SETTING FOR POLICY

Yes it was called the Dark Ages, and it lasted 400 years.
– John Maynard Keynes August 1932
when asked whether there had ever
been anything like the Depression

The Great Depression triggered major Federal development of the Columbia River when President Roosevelt approved starting construction of Grand Coulee and Bonneville dams in 1933 to provide jobs. The dams were born in the Depression, and a whole generation of workers carried with them vivid recollections of the hard times.

The Wall Street stock market disaster of October 1929 was followed by continuing declines, bottoming out in July 1932. Instead of the usual lull in June, July, and August 1929, the Dow Jones industrial average rose 110 points to 449 and peaked at 452 September 3. The economy had peaked in June. The Federal Reserve Board industrial production index slid 7 percent from June to October. Steel started down in June. Housing had been down several years. Agriculture had been suffering since 1920.

The market began its slide with a 12 point drop October 19, 1929. October 24 was the panic's first day of a "frightful collapse, blind, relentless fear, and horrified incredulity." The bankers could not restore confidence. On Black Monday, October 28, the market dropped 49 points and the next day another 43. Rises of 31 and 21 points on October 30 and 31 were followed by the Foshay electric utility holding company failure November 2.

Foshay was not a one-layer holding company of the type still permitted by law, which provides financing and central services to a number of operating electric utilities. Rather it was one of the layers upon layers of utility holding companies set up for financial leverage and manipulation which fell like a house of cards from 1929 to 1932. Many people lost their life savings, and some companies went into receivership.

Samuel Insull, who had provided dynamic leadership and imagination for the young electric utility industry, had overextended his holding company empire. He fled to Greece to avoid prosecution and became the symbol of defeat and demoralization. He was not alone in the game of financial manipulation.

On Monday, November 4, the market dropped 22 points, two days later 37, and November 11 another 50 points, leveling November 13 at 224. The market recovered some-

During the construction of the Grand Coulee Dam large sluice pipes or conduits were embedded in the spillway portion of the dam. These pipes carried much of the river water during the pouring of the upper half of the dam. The sluice could be used for flood control. The picture shows a sluice pipe at Grand Coulee before it is buried in the solid concrete.

what during the first quarter of 1930, but a large drop in June 1930 started a steady 2-year slide down to 58. From September 3, 1929 to July 8, 1932, U.S. Steel went from 262 to 22. AT&T 304 to 72, GM 73 to 8, and Ward 138 to 4. Investment trusts and many stocks disappeared.

John Kenneth Galbraith's 1954 book, *The Great Crash,* traces the 1928-29 boom to the 1925 Mellon tax cut, the Florida land boom, advent of the speculative radio industry, the leverage of investment trusts, the watered stocks and bonds of electric utility holding companies, speculator buying of stocks on as little as 10 percent margins, and the low interest, easy money policies of the Federal Reserve Board from 1927 to 1929. The Government did nothing to slow the boom. The resulting bust wiped out 87 percent of the market's 1929 peak values.

In turn the causes of the Great Crash helped bring on the Great Depression. Only a fraction of Americans now living were old enough to experience, much less understand, the disastrous decade of persistent, continuing unemployment, and unrelenting, grinding poverty.

Unemployment reached about 4 million in 1930, 8 million in 1931, 12 million in 1932, and peaked at more than 13 million in 1933. A fourth of the nation's work force was unemployed that year. Unemployment exceeded an average of 8 million each year for the entire decade, except for slight relief in 1937. Every large city had its soup lines. The Pacific Northwest was especially hard hit by the Great Depression.

Like a Row of Dominoes. As electric utility holding company stocks crashed, financing sources dried up, power sales to closed factories stopped, and utilities virtually stopped all construction. This caused further reverberations nationally for electrical equipment and appliance manufacturers and the construction industry. A review of the plight of electric utility construction at that time provides insight, notably on the Pacific Northwest situation.

The National Electric Light Association (NELA) in December 1927 issued Statistical Bulletin No. 1, *Statistical Data for the Electric Light and Power Industry for the Year 1926.* This pioneering 5-page leaflet initiated the annual series taken over by the Edison Electric Institute on January 1, 1933, when NELA was abolished. The series is still published annually.

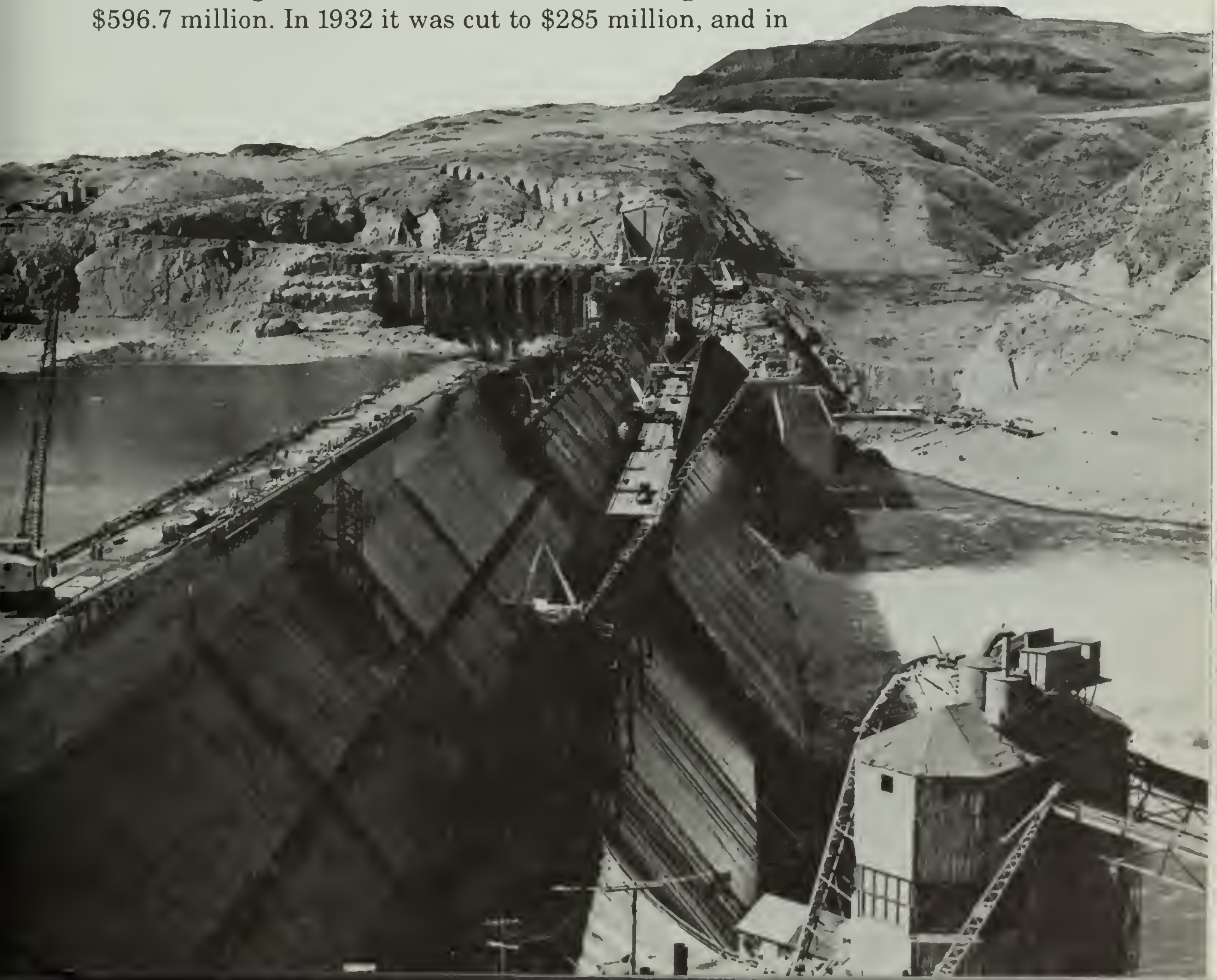
U.S. electric utility gross construction expenditures in 1926 were $772.5 million: 30 percent for generation, 34 percent for transmission and substations, and 27 percent for distribution. The transmission expenditure reflected the aggressive acquisition of small private electric utilities and hundreds of city-owned electric systems and their merger into company-wide transmission grid systems. The NELA Statistical Bulletin reported $919.4 million for utility construction in 1930, a peak year:

> "In spite of the depression, more money than ever before was spent by the electric light and power industry for the expansion and improvement of its facilities. The total increase in generating capacity during the year was 2,490,000 kW...The decrease in the proposed expenditures for 1931 is caused to some extent by the decline in the price of materials and in the cost of construction, so that the actual physical volume of new work more nearly approximates the general average of previous years than the figures would seem to indicate."

The optimism was short lived. Generation capacity reached 32,050,000 kilowatts in 1930. Generating facilities operated at only 32.9 percent of capacity for the year as a whole, a drop from 36.2 percent in 1929, caused mainly by curtailment of industrial loads. Energy generation fell 1.7 percent to 88.6 billion kWh.

Moreover, the $701.9 million 1931 electric utility construction budget did not materialize. The actual figure was $596.7 million. In 1932 it was cut to $285 million, and in

The pouring of concrete at Grand Coulee Dam took six years 1935-1941. This construction picture shows the dam well along. The concrete mixing plant is in the right foreground.



1933 bottomed out at $129.3 million. The annual investment in hydroelectric generation fell from $117.6 million in 1930 to $4 million in 1933, and transmission facilities from $145 million in 1929 to $16.1 million in 1933.

The drop was especially acute in the Pacific Northwest where nearly all private electric companies were owned by the Electric Bond and Share Company and other holding companies. From 1930 to 1934 annual utility construction expenditures in Washington State plunged from $34.6 to $1.73 million, Oregon from $9.55 to $1.07 million, Idaho from $10.5 to $0.41 million, and Montana from $3.52 to $0.32 million.

The Nation's generating capacity stood at about 34 million kW from 1932 through 1936. Energy sales sagged from 75.3 billion kWh in 1929 to 63.7 in 1932, and then increased to 77.6 billion kWh in 1935.

The electric utility construction doldrums was part of the investment and employment vacuum that set the stage for Federal power projects.

Attacks on City Light Plants. Another characteristic of the setting for policy development was the attack on public power. Municipally owned electric systems accounted for merely 10 percent of the nation's electric utility business. Their low rates and major contributions to local government in lieu of taxes caused privately owned utilities to resent them. Some cities boasted of their tax-free status. They did not levy taxes because electric plant profits offset all local government costs. During the 1930's Tacoma, Washington was often cited nationally for its very low electric rates. Seattle, Washington had both a city-owned and privately-owned utility in a costly competition. The public versus private power issue was very real in the Pacific Northwest.

The number of U.S. city-owned systems increased from four in 1882 to a peak of 3,084 by 1923. Early in the 1920s the private utility industry initiated state information committees and an extensive publicity campaign aimed at creating a favorable climate for buying out city-owned electric systems allegedly in the interest of efficiency. The Edison Electric Institute reported 1,592 city-owned electric systems were "discontinued" between 1923 and 1932. There were 315 sales in 1926 alone. Advocates and adherents of municipal ownership were vilified and castigated as un-American and enemies of private enterprise.

The companies were accused not only of propagandizing, but also corrupting and bribing public officials and community leaders. The companies filed many "citizen suits" to oppose a city's intent to buy a new diesel engine or improve the electric system. The companies were also criticized for their high rates, unreliable service, and failure to serve rural areas. These actions are well documented in Federal Trade Commission reports of 1928 to 1935 and articles and books on the FTC investigation. They resulted in expanding awareness and distrust of private electric utilities, notably in the Congress, which virtually became a national attitude after the collapse of the Insull empire and other public utility holding companies.

This attitude contributed to making electric power a major national political issue and provided an opportunity for presidential candidate Franklin D. Roosevelt to stress in many speeches that he disapproved of Samuel Insull's activities and would do something about the electric utility problem.

The Two-Year Franchise. Each election provided a two-year franchise for a Federal program, and sometimes, as in 1937, it did not last two years.

Every national election affects the historical setting for policy decisions. The resulting policy, in turn, can affect the next election.

Promising prosperity, presidential candidate Herbert Hoover received 58 percent of the vote in 1928, with an electoral count of 444 to 87 for Al Smith. Actually the Democrats improved their showing over the 1924 election by making gains in the farm belt and big cities. The Republicans enjoyed a 17-vote margin in the Senate and 100 in the House in the 71st Congress. While Smith lost New York State by 100,000, Franklin Roosevelt bucked the Republican tide to become Governor with a 25,000-vote margin. Conservative Democrat Harry Byrd of Virginia told Roosevelt, "You are the hope of the Democratic Party."

The 1930 election showed some voter disappointment with the economy, the President, and the Republican Party. The Democrats led in the House 219 to 214. The Senate split 48 Republicans, 47 Democrats, one Farmer-Laborite. Roosevelt won reelection as New York governor by a record 725,000 plurality. The 1930 elections strengthened the utility industry's public power sector, as Washington and Oregon voters approved PUD laws. Power issues in vari-

A proud city tells the world that it is served by public power. During the 1920's and 1930's the City of Tacoma's low electric rates were often cited as evidence of what could be achieved by means of low cost power.

ous states indicated voter dissatisfaction with private utility companies.

For the next two years Congress was eager to battle the depression, but President Hoover was loathe to use public works as a mitigant. Congress promptly approved the few recommendations he did make. The depression deepened. Unemployment doubled.

People in desperate straits tend to vote for change. In the 1930s the choice went to totalitarian dictatorships in some European elections. Sweden and the United States voted for a more liberal policy.

Roosevelt received a plurality of 7 million votes November 8, 1932, with 472 electoral votes to 59 for Hoover. The West and the South voted solidly for Roosevelt. The Democrats held 70 percent of the House seats and a 22 seat majority in the Senate.

The interval between the election and inauguration brought to a head the long growing crisis of the banking system. The closing of one bank caused runs on others as depositors rushed to make withdrawals. The Roosevelt Administration took office March 4, 1933, in a crisis atmosphere. It briefly closed all banks on March 6, and then spent 100 hectic days passing emergency legislation. Recovery plans included funds for public works.

The Great Depression was so dominant it obscured changes underway or about to start. A 1933 report by President Hoover's special committee on social trends, *Recent Social Trends in the United States,* identifies an incipient climate for change in many areas of American life, particularly as to social and economic issues.

Historian Arthur M. Schlesinger Jr. apparently confirms this foundation for change when in 1957 he opened his three-volume *The Age of Roosevelt* with these words:

> "The Age of Franklin Delano Roosevelt covered much more than the dozen years of his Presidency. The events of 1933-45 climaxed half a century of American life."

The Depression nonetheless marked a major turning point in American history. It changed the Nation's economic beliefs and attitude toward business. It revised American politics and the Government's role. The laissez faire doctrine gave way to public demands for government action to battle the depression, and the policies and special interests that contributed to its onset.

Finally, the Depression provided the policy setting for the Roosevelt Administration to begin developing the Columbia River, as promised by Roosevelt in his 1932 campaign speech in Portland.

5. LIGHTNING STRIKES TWICE

Uncle Sam took up the challenge
In the year of Thirty-Three
For the farmer and the factory
and for all of you and me,
He said, 'Roll along, Columbia,
You can ramble to the sea
But River, while you're rambling,
You can do some work for me.'
– Grand Coulee Dam
Song by Woody Guthrie

In the depths of the depression, the people had heard enough political oratory. Instead of the thunder of words, they wanted the lightning of action.

That lightning struck twice in the Pacific Northwest in 1933 as the President approved the start of construction on Bonneville and Grand Coulee Dams. Construction had been underway two years before Congress legalized the dams in the River and Harbor Act of August 30, 1935.

On April 17, 1933, Washington Senator C. C. Dill and Washington State Grange Master Albert S. Goss called on President Roosevelt to urge construction of Grand Coulee Dam. He finally agreed to the expenditure of $60 million. On April 26 the Bureau of Reclamation provided Dill with a $59,225,000 estimate for a low dam with 150-foot head and 520,000 kilowatts of capacity, as a single-purpose power project. The President asked Dill to do two things.

First, provide for power projects in the pending emergency bill for public works. "Reclamation" was deleted from the bill due to Midwestern objections, and Dill redrafted section 202 of the proposed National Industrial Recovery Act (NIRA) to include "development of water power" and "transmission of electric energy." With that language the bill became law June 16, 1933. The new language would soon be used.

Second, to hasten planning, Dill was to ask Washington Governor Clarence D. Martin for an estimated $337,000 in State funds to finance preparation of Grand Coulee Dam plans and specifications for the bid call. With amazing speed the State contracted with the Bureau to do the planning. The State also obtained the water rights, a Federal Power Commission preliminary permit, and some of the land for the project. Governor Martin drove a stake and Senator Dill moved a shovel of dirt to break ground at the damsite July 16, 1933 as a *state* project.

Meanwhile, on March 11, 1933, Oregon Senators Charles L. McNary and Frederick Steiwer introduced a bill to authorize a dam on the Columbia River at Warrendale. When no action was taken, McNary and Representative Charles H. Martin called on President Roosevelt on about May 5 to remind him of his campaign promise to Oregonians.

By then Roosevelt knew his campaign promise had been interpreted in Washington to mean construction of Grand Coulee Dam and in Oregon construction of the dam at Warrendale. He also knew the Army Corps of Engineers' 308 report had recommended a ladder of 10 dams on the Columbia River between the Canadian border and tidewater, and that the project farthest downstream be built first to provide a navigable waterway to The Dalles. So, the President committed $31 million to the project. When the Portland *Oregonian* printed a victory story July 14, 1933, however, the Spokane *Spokesman-Review* interpreted this on July 23 to mean Grand Coulee had lost out.

Dill rushed to Washington, D.C. On July 27, 1933 the Federal Emergency Administration of Public Works (PWA) approved $63 million for Grand Coulee. Dill was met at the train August 1 at Spokane by a victory crowd of 5,000.

On August 21 the Army Chief of Engineers approved moving the damsite to Bradford Island (Bonneville) from Warrendale due to an unsuitable foundation. PWA Project No. 28 at Bonneville was alloted $250,000 September 23 for surveys, and $20 million September 29 for construction. Site work started November 6. Further core drilling prompted moving the spillway 3,000 feet downstream to its present location.

The Federal Government had taken over the Grand Coulee project from Washington State on November 1. U.S. Department of the Interior Secretary Harold L. Ickes signed an Order of Taking on December 19 to expedite land acquisition. Mason-Walsh-Atkinson-Kier (MWAK) was awarded the dam construction contract July 13, 1934 on its bid of $29.3 million, but the Government reserved the option to change to a higher dam.

Accompanied by Secretary Ickes, President Roosevelt delivered major speeches to large crowds at Bonneville and Grand Coulee August 3 and 4, 1934. He envisioned Bonneville as the first step toward enabling barges to navigate north into Washington and into Idaho's wheat country:

Looking downstream across the Bonneville Dam construction site, this picture shows the foundations for half of the spillway in place.

"That is a dream my friends, but not an idle dream, and today we have evidence of what man can do to improve the conditions of mankind."

He then turned to power:

"There is another reason for the expenditure of money in very large amounts on the Columbia – in fact there are a good many reasons. While we are improving navigation we are creating power, more power, and I always believe in the old saying of more power to you. I don't believe that you can have enough power for a long time to come and the power we will develop here is going to be power which for all time is going to be controlled by the government.

"Two years ago, When I was in Portland, I laid down the principle of the need of government yardsticks so that the people of this country will know whether they are paying the proper price for electricity of all kinds. The Government can create yardsticks."

The problem of shifting from a low dam at Grand Coulee to a high dam remained. Secretary Ickes became a believer in the high dam as a result of his August 4, 1934 site visit. Bureau of Reclamation studies and many Pacific Northwest leaders strongly supported the high dam.

The dilemma worsened April 29, 1935. The U.S. Supreme Court ruled certain dams, including Bonneville and Grand Coulee, had not been properly authorized by Congress. Congress remedied the defect by authorizing the projects, but Grand Coulee almost fell by the wayside on the argument it was an irrigation project. Representative Knute Hill explained Grand Coulee mainly was a power project whose irrigation features wouldn't be added until 15 to 25 years in the future. His argument won on a roll call of 201 to 126.

The President signed the River and Harbor Act on August 30, legitimizing Bonneville, Grand Coulee, and other dams. On June 5, Secretary Ickes had issued Order for Changes Number One approving the high Grand Coulee Dam. In passing the authorizing law, Congress approved Grand Coulee as a high dam and multiple-purpose project. Concrete pouring began December 6, 1935.

On February 7, 1938 the MWAK group and Henry J. Kaiser won the $34.4 million contract to complete the dam. The concrete pour was completed October 15, 1941. By then Bonneville Dam had been producing power for 3 years.

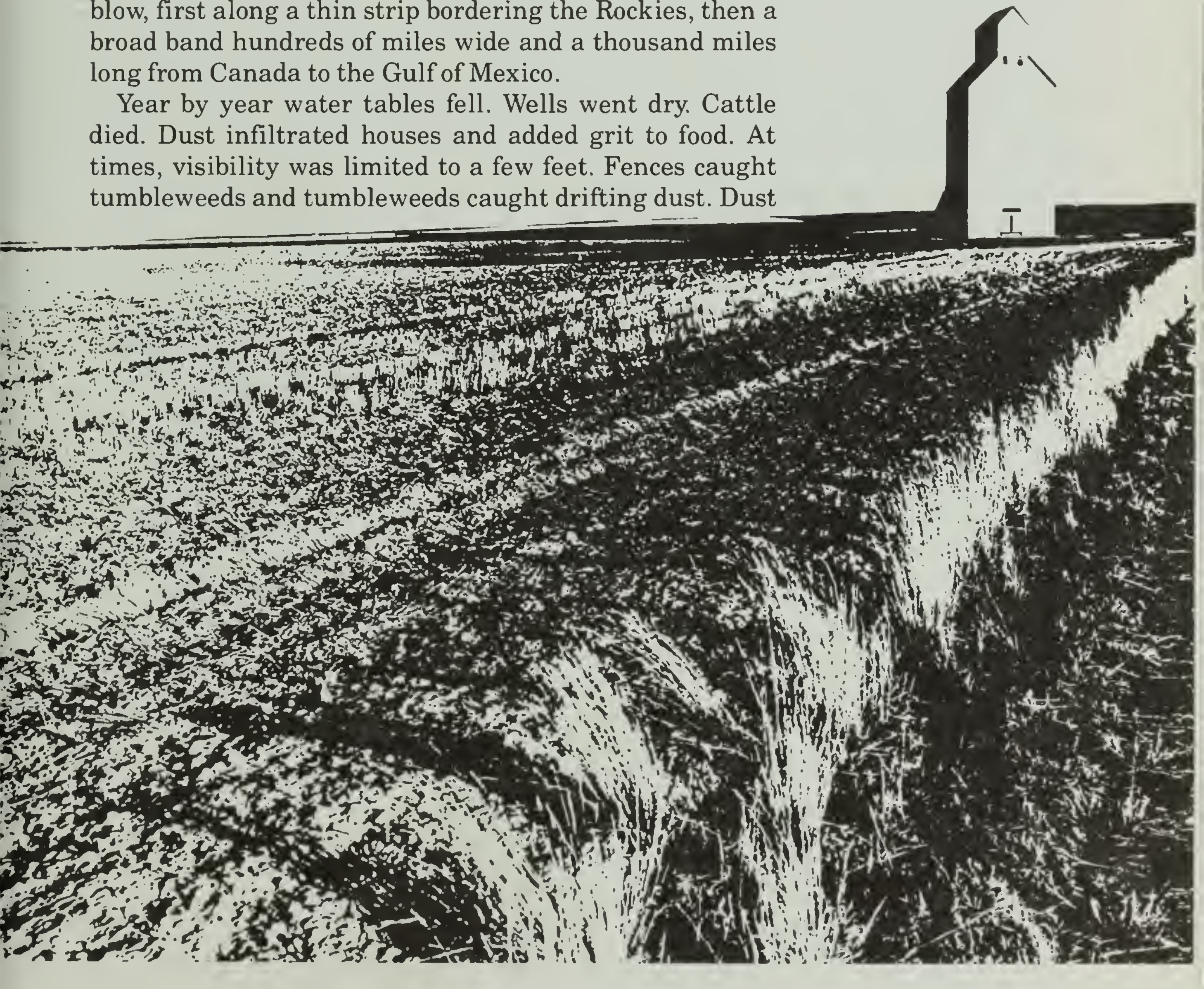
Advance planning for the two dams paid off for the Pacific Northwest. Throughout the depression, and especially in 1933, funds for emergency public works went to proposed projects with plans ready so men could go to work quickly. The start of the two projects triggered and gave momentum to development of the Columbia River, and became a major historic turning point for the people and economy of the Pacific Northwest.

Dam Building Continues. The building of dams provided much needed jobs for the region. The extractive economy based on lumber, fish, minerals, and farm produce was inherently seasonal with work in summer and unemployment the rest of the year. The Great Depression was very severe on the region and continued to dominate the Pacific Northwest economy, but with an added factor, the influx of tens of thousands of unemployed Dust Bowl refugees from the Great Plains.

After heavy flooding during the winter of 1933-34, it virtually stopped raining in the Upper Plains States during the remainder of 1934. Crops shriveled. Dust began to blow, first along a thin strip bordering the Rockies, then a broad band hundreds of miles wide and a thousand miles long from Canada to the Gulf of Mexico.

Year by year water tables fell. Wells went dry. Cattle died. Dust infiltrated houses and added grit to food. At times, visibility was limited to a few feet. Fences caught tumbleweeds and tumbleweeds caught drifting dust. Dust

Overhead aerial cableways were extensively used for placing concrete at Pacific Northwest dams. Millions of acres devoted to growing wheat and other grains were highly subject to loss of topsoil under drought conditions such as existed in the 1880's and 1930's.



obliterated roads. Children died of dust pneumonia. Enormous clouds of dust moved eastward like a shroud across the eastern states and into the Atlantic Ocean.

Dust Bowl refugees abandoned their farms and moved west. Population declined in five Dust Bowl states from 1930 to 1940. The California population increased 1.2 million, Washington 172,795, and Oregon 135,898. This drove up the number of unemployed.

Former U.S. Senator Richard L. Neuberger reports in his book *The Promised Land* that many refugees carried newspaper clippings about the speech President Roosevelt made at Bonneville Dam on August 3, 1934, in which he envisioned:

"In this northwestern section of our land, we still have the opening of opportunity for a vastly increased population. There are many sections of the country, as you know, where conditions are crowded. There are many sections of the country where land has run out or has been put to the wrong kind of use. America is growing. There are many people who want to go to a section of the country where they will have a better chance for themselves and their children...

"Out here you have not just space, you have space that can be used by human beings – a wonderful land – a land of opportunity."

When he dedicated Bonneville Dam 3 years later Roosevelt spoke pointedly of the mistakes that caused the enormous dust storms in the 10 semiarid states. Thousands of farm families were left destitute. Federal relief costs exceeded two billion dollars.

Emigration from many states to the Pacific Northwest continued. The combined population of Oregon and Washington increased by more than a million from 1940 to 1950. Most of the later arrivals came intent on obtaining wartime employment, and remained.

In the depression years few scenes had the visual impact and sense of excitement of the Grand Coulee Dam construction site at night. Approaching it in the black of night was like coming into daylight. The powerful lights allowed concrete pouring to continue throughout the night. It continued for 6 long years through heat and cold, snow, wind, dust, and grit.

Construction towns never seemed to rest. Juke boxes blared the beat for dancers and people on the move. Peak employment reached 7,455 in June 1937. The hustle and bustle of construction contrasted sharply to depression scenes of soup lines and the unemployed.

6. PLANNING PAID DIVIDENDS

Make no little plans: they have no magic to stir men's blood, and probably themselves will not be realized.

Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing asserting itself with ever growing insistency.

– Daniel Hudson Burnham

While construction progressed day and night on Grand Coulee and Bonneville, the Administration and Congress had to face the question of how to handle the resulting 2½ million kilowatts of electric power production. Bonneville Dam would produce power from its first generator in 1938, and Coulee 3 years later. Who would use the power? Where would it go? How would it get there? Who would build and operate the transmission lines? In fact, would the power be used at all? Political opponents asked that question as did many other persons, especially magazine writers.

The September 21, 1935, issue of *Collier's* contained an article, "Power in the Wilderness," in which writer Walter Davenport stated that power would go begging. He pictured the 18 Grand Coulee Dam generators "singing their Lorelei song to cynical industry." The generators "will be wasting their music on the desert air." And, he raised one particularly pertinent point: "We're building huge power factories but not transmission lines."

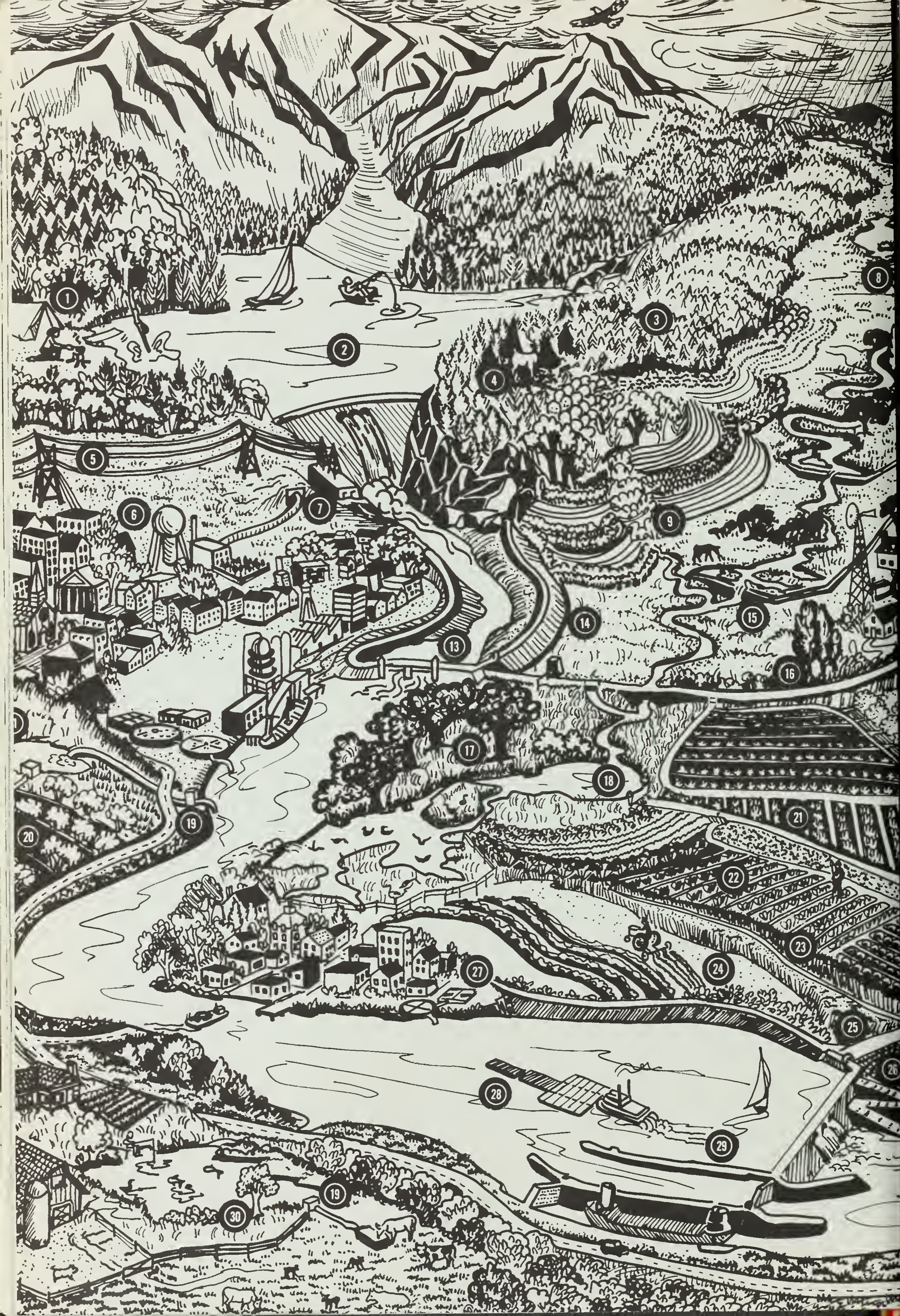
In *The Saturday Evening Post* of July 13, 1935, Robert Ormond Case wrote of Grand Coulee Dam as "The Eighth World Wonder." He conjectured that the dam would become as equally a useless monument as the Egyptian pyramids, which it surpassed in size.

In the June 19, 1937 *Collier's,* Jim Marshall wrote of Bonneville Dam as a "Dam of Doubt," referring approvingly to Davenport's article on Grand Coulee. Both articles alleged cost overruns. Both noted the area's sparse population, such as six-tenths of a person per square mile in Oregon's Harney County. Marshall perceived many problems at Bonneville Dam:

Would the salmon fail to traverse the Bonneville Dam fish ladders, a failure that would put thousands of people out of work? Would ships ever use the Bonneville locks? Would industries move into the area? If they did, would residential customer's power payments subsidize industry?

Nationally the Bonneville and Grand Coulee projects did not enjoy a good press in the 1935-1937 period.

In contrast, the June 5, 1943, issue of *The Saturday*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Evening Post carried an article "The White Elephant Comes Into Its Own" by Frank J. Taylor. He saw the value of the two dams in terms of enabling the production of aluminum for war equipment needs. He maintained building the dams and power lines was "one of the best investments Uncle Sam has ever made."

Planning Paid Dividends. The Cascade rapids in the Columbia River Gorge were a serious navigational barrier until Bonneville Dam was completed in 1938.

Starting in 1850, various individuals and groups had built tramways, portage roads, and railroads on both sides of the river to bypass the rapids and later Celilo Falls near The Dalles. Portage facilities invariably fell into the hands of the navigation companies. In 1874 Congress authorized the Cascade Canal and Locks, which the Corps of Engineers completed in 1896 at a cost of $3.8 million. Its use was limited. The need to improve navigation was the incentive for early advocates of Bonneville Dam.

The need for irrigation was the impetus for building Grand Coulee Dam. Columbia Basin farmers had learned dry land farming methods would not work when annual precipitation fell to 10 inches or less. In 1885 the governor of the Washington Territory envisioned the need for an irrigation system in the Columbia Basin. In 1903 the U.S. Reclamation Service reconnoitered the area from the Pend Oreille River to the Columbia Basin. It proposed a "gravity plan," comprised of a canal to carry water for irrigation purposes. Many other studies were made.

The concept of building a high dam at Grand Coulee and pumping water 290 feet above the reservoir for irrigation use was brought to public attention in the July 18, 1918, *Wenatchee Daily World.* In the next 15 years the "pumping plan" gradually gained popularity over the gravity plan. Numerous studies and foundation drilling by the Bureau of Reclamation and Washington State prompted publicity and legislative hearings. By 1931 the Bureau of Reclamation and the Corps of Engineers agreed on the pumping plan and recommended Grand Coulee Dam. The tradition of planning for Grand Coulee Dam was derived from the conservation heritage and Powell's *Arid Lands Report.*

Congress Looks Ahead. River basin development and the Corps of Engineers received a boost when Congress adopted the River and Harbor Act of 1925, directing:

"Sect. 3. The Secretary of War, through the Corps of Engineers of the United States Army, and the Federal Power Commission are jointly hereby authorized and directed to prepare and submit to Congress an estimate of

The drawing depicting a multiple purpose river basin development was prepared for the 1950 report of the President's Water Policy Commission of which Morris L. Cooke was Chairman.

A MULTIPLE-PURPOSE RIVER BASIN DEVELOPMENT

1. Recreation
2. Multiple purpose reservoir
3. Forest cover
4. Wildlife
5. Transmission line
6. Municipal water
7. Power plant
8. Beaver dam
9. Erosion control
10. Well
11. Equalizing reservoir
12. City and industrial waste treatment plant
13. Diversion dam
14. Levee flood control
15. Water-spreading dikes
16. High line canal
17. Wildlife refuge
18. Regulating basin
19. Pump
20. Sprinkler irrigation
21. Low line canal
22. Gravity irrigation
23. Drain
24. Contour plowing
25. Canal
26. Fish ladder
27. Community treatment plant
28. Navigation
29. Re-regulating reservoir
30. Farm pond

the cost of making such examinations, surveys or other investigations as, in their opinion, may be required of those navigable streams of the United States, and their tributaries, whereon power development appears feasible and practicable with a view to the formulation of general plans for the most effective improvement of such streams for the purposes of navigation and the prosecution of such improvement in combination with the most efficient development of the potential water power, the control of floods, and the needs of irrigation: Provided, that no consideration of the Colorado River and its problems shall be included in the consideration or estimate provided herein."

On April 12, 1926 the Secretary of War submitted cost estimates and recommended comprehensive surveys.

Workers installing one of the Bonneville Dam turbines pose for posterity.

Congress published the report as *House Document No. 308-69/1* (hence the name "308 reports" for all subsequent studies). The River and Harbor Act of January 21, 1927 authorized the surveys which resulted in the monumental 308 reports on the Columbia, Tennessee, Missouri, and other rivers. On March 29, 1932 Congress received the 1,845-page report, *Columbia River and Minor Tributaries* (H. Doc. 103-73/1):

"...containing a general plan for the improvement of the Columbia River and minor tributaries for the purposes of navigation and efficient development of water-power, the control of floods, and the needs of irrigation."

The report proposed 8 dams on the Columbia River, including Grand Coulee and Bonneville, and also proposed upstream storage reservoirs such as a dam at the Hungry Horse site and raising the levels of Flathead and Pend Oreille Lakes. In 1933 the project planning paid off.

At the Washington D.C. level the Board of Engineers changed the 8-dam plan to 10 dams. An early scheme had also considered a high dam at The Dalles to create a reservoir extending to Rock Island Dam. The chief debate within the Corps was whether to endorse the Grand Coulee Dam recommendation of Major John S. Butler, Seattle District Engineer. He defended his findings with courage and competence, but at the end of a week of questioning and open hostility to Grand Coulee Dam, he concluded "That is my report." He made it stick. It hurt his career.

The year 1933 marked the beginning of the enormous Columbia River development and a change in the Pacific Northwest economy. Roosevelt's August 3, 1934, prediction of navigation to Idaho became reality 41 years later in 1975, with completion of eight navigation dams. By 1980, a third powerhouse was nearly complete and in partial operation at Grand Coulee. The two dams became the baseline for one of the world's largest transmission systems.

All this involved planning and the planning paid dividends in navigation, irrigation, and power. In turn the experience with the Bonneville and Grand Coulee projects fostered strong recognition of the value of planning.

While many economic and political factors came to a junction in the President's decisions, not the least of them was his personal interest in electric power and his enthusiasm gained from his Pacific Northwest visits of 1920 and 1932.

The availability of the Army's plan for Columbia River development enabled President Roosevelt to give the go ahead signal in 1933 to put people to work building those dams that the shortsighted magazine pundits questioned.

John S. Butler

Part Three 1935-1937

THE TRANSMISSION ISSUE

7. The Transmission Issue
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9. A Charter for Power
10. The Preference Clause
11. Postage Stamp Rate Policy
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7. THE TRANSMISSION ISSUE

Inventions which abridge distance have the greatest influence on human history.

Attributed to Thomas Macaulay
–By Irving Fisher

Time and again the people of the Pacific Northwest have listened to thundering orations:

> *The Columbia River is the miracle river of America...It is the greatest hydroelectric stream in America....It is an oil well that will never run dry, a coal mine that will never thin out....The Pacific Northwest possesses over 40 percent of the undeveloped water power of the nation....The greatest single asset of the Pacific Northwest is the Columbia River.*

This quotation paraphrases what dozens of public officials and candidates for public office told their receptive audiences in the Pacific Northwest from about 1920 to 1937. The focus was on the building of dams. Hardly anyone spoke up on the need for high voltage transmission lines to carry power from the hydroelectric dams to the centers of population.

The question of whether the Federal Government should construct transmission systems was avoided by selling the power from early Federal dams at the generator bus or "bus bar," as at the Muscle Shoals project on the Tennessee River and Hoover Dam on the Colorado River.

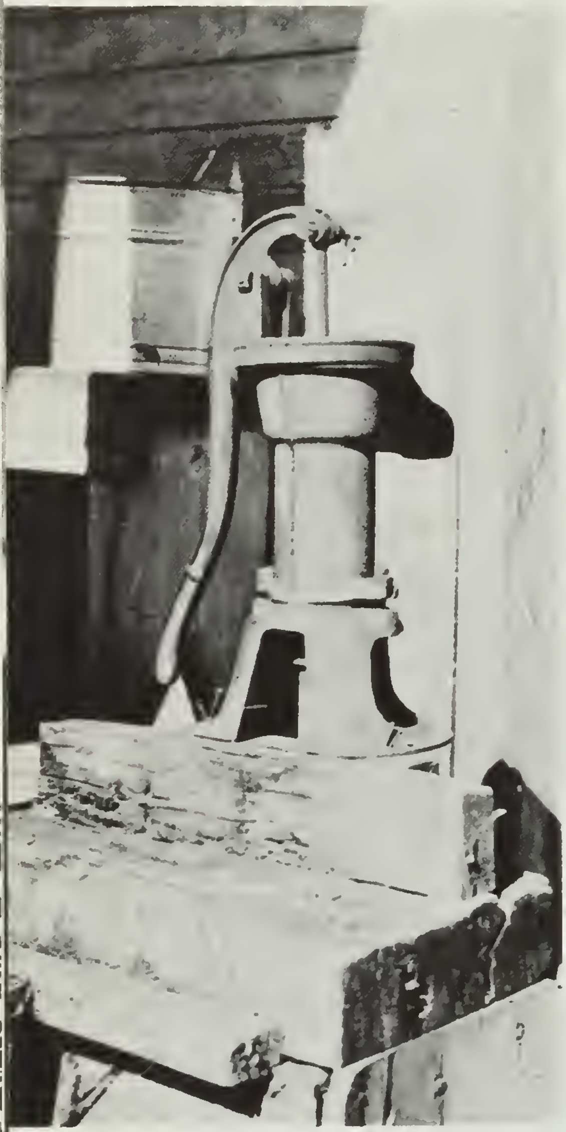
The transmission issue, with all its ramifications, constituted the Bonneville controversy of 1935, 1936, and 1937.

The view that public dams would need public transmission in order to avoid private monopoly carried the day. In time it came to be recognized also that the planning and building of transmission lines and substations had to parallel dam construction because a major high voltage line requires years to build.

But construction on Bonneville Dam was four years along by the time the Congress belatedly passed the Bonneville Project Act in 1937. A year later when the first generator was completed, the only transmission line available to take power was the modest line which had provided construction power. Fortunately President Roosevelt was able to use emergency relief funds for a crash construction program which completed the first 230,000 volt line to Vancouver in December 1939. At first Congress was critical of the slowness of transmission construction but by 1941 the record-breaking construction accomplishment of the new agency led the Congress to authorize accelerated building of lines to serve new war loads

President Franklin D. Roosevelt, here shown with his wife Eleanor, saw the Pacific Northwest as a land of opportunity and as a focal point for applying his ideas on conservation, water power, river development, rural electrification, and public works to create jobs. In 1934 and 1937 he spoke at both Bonneville and Grand Coulee Dams outlining his ideas.

Ray Atkeson photo



The pump handle is one of the many symbols of life before rural electrification.

in the Pacific Northwest.

The Historical Setting. Politically, the New Deal had its ups and downs from 1934 through 1937. The 1934 election year did not look promising. The winter floods of 1933-1934 and the drought in 1934 brought disaster to many areas. It took a long time to get deficit spending programs underway. The National Industrial Recovery Act was snarled in the courts. Labor disputes and strikes plagued the economy.

Nevertheless, on November 6, 1934 the Democrats increased their majorities to 229 in the House and 44 in the Senate. At the state level, only seven Republican governors survived. Harry Truman was elected in his first term as a U.S. Senator. The election removed many conservative "old guard" Republicans of the 1920s.

The election mandate resulted in the "second hundred days" of legislative progress, actually 177 days. It reflected and helped build the "grand coalition" of labor, the South, women, ethnic groups, city bosses, and blacks. It emphasized natural resources, labor and social legislation, slum clearance, and housing.

The Public Utility Holding Company Act was passed after a major battle. President Roosevelt created the Rural Electrification Administration by executive order in May 1935, which Congress gave statutory basis a year later.

Politically, the Wagner Labor Act, assuring the right of collective bargaining, coupled with the rise of the Council of Industrial Organizations (CIO) helped strengthen the support for the Democrats.

The President's greatest difficulties came from the Federal courts, particularly the U.S. Supreme Court, comprised mainly of conservative holdover judges. Many hurriedly written early New Deal laws were subjected to legal attack. The conservative courts issued hundreds of injunctions, and the Supreme Court declared many New Deal laws unconstitutional.

Historian Arthur M. Schlesinger Jr. distinguishes between the first and second New Deals. The first called for national economic planning as illustrated by the National Industrial Recovery Act.

On what Schlesinger called Black Monday, May 27, 1935, the National Industrial Recovery Act, which contained the authority to build dams like Bonneville and Grand Coulee, went down on a 9 to 0 vote. Justice Brandeis used the occasion to tell presidential aide Thomas Corcoran:

"This is the end of this business of centralization, and I want you to go back and tell the President that we're not going to let this government centralize everything."

The second New Deal emphasized regulation of business and encouragement of competition. It also led to better drafting of laws by such people as White House staffers Ben Cohen and Tom Corcoran.

In his second acceptance speech at the Democratic Convention in Philadelphia June 27, 1936, Roosevelt set out the new goal of "equal opportunity in the market place." He abandoned the term New Deal.

Although the nation was not out of the woods economically, unemployment had been cut almost in half by 1936. The Federal Reserve Board industrial production index, which had dropped from 125 in 1929 to 58 in 1932, rose to 101 in 1935 and 121 in 1936. National income rose 50 percent from 1932 to 1936.

The Democrats opened their June 1936 convention driving reapers on Philadelphia streets as a reminder that Hoover's 1932 campaign prediction hadn't materialized. He had said that the grass would grow on the city streets if Roosevelt became president.

Roosevelt won a landslide election victory November 3, 1936 by a record 60.8 percent of the total vote to carry all states except Maine and Vermont. He tallied a popular vote of 27.8 million to 16.7 million and an electoral count of 523 to 8. More than 75 percent of Congress was Democratic, the House 331 to 89, the Senate 76 to 16.

Carrying innumerable buckets of water for the cows is just another example of a job that can be done better, cheaper, and automatically by electricity.

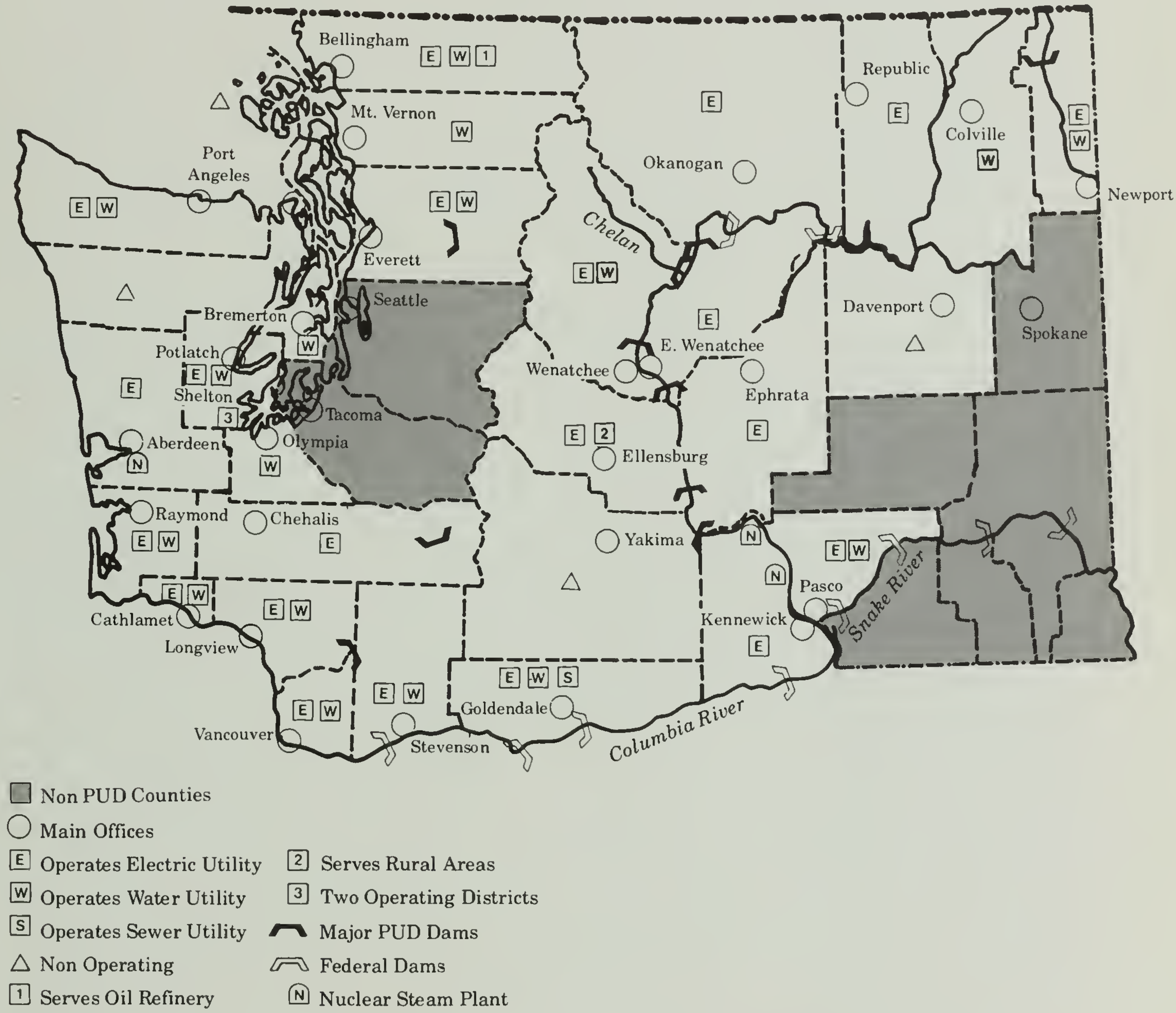
The Pacific Northwest Setting. One of the new Representatives elected November 3, 1936 was Warren G. Magnuson. He would soon get a chance to vote for the Bonneville Project Act, and over a period of four decades to help persuade Congress to make more than six billion dollars in appropriations for Columbia River dams and related transmission facilities. Born in Minnesota in 1905, Magnuson graduated in law from the University of Washington in 1929, served as special prosecuting attorney in 1932, in the Washington State Legislature in 1933, and was elected as prosecuting attorney of King County in 1934. After 8 years in the U.S. House of Representatives, he was elected to the U.S. Senate in November 1944 replacing Senator Homer T. Bone who was appointed to the Circuit Court of Appeals for the Ninth District. In January 1979 Magnuson became the senior member of the Senate, serving as President Pro Tempore as well as Chairman of the Appropriations Committee.

All four Pacific Northwest states were well aware of the electric power issue, and each of the states had a representative on the Pacific Northwest Regional Planning Commission which would soon offer its solution to the problem of marketing Bonneville Dam power output.

The political awareness on the power issue was particularly acute in the State of Washington as a result of the 1936 election for two reasons. On a statewide ballot the voters turned down a proposal for the State to build electric transmission lines, as did Oregon voters at the same 1936 election. This eliminated the alternative of State-owned transmission systems and thus clarified the transmission option as simply either Federal or private. Secondly, the voters in 15 Washington counties established public utility districts (PUDs) with authority to go into the electric business. Under the Washington PUD law adopted by the voters in 1930, the state by 1940 had 29 authorized PUDs – the first 4 in 1934, 15 more in 1936, 6 in 1938, and 4 in 1940. The PUDs represented potential customers for electric power from Bonneville and Grand Coulee Dams. It was the 1936 vote forming new PUDs that bore home to the U.S. Senators and Representatives from Washington State that they represented a strong public power constituency that could not be ignored. That still left wide open the question of how to interpret the election mandate as it might relate to the problem of selling electricity from Bonneville Dam.

Transmission Awareness Slow. Many small urban electric systems consisted of generating plants that fed directly, without intervening transmission lines, into the distribution system. In the Pacific Northwest, however,

PUBLIC UTILITY DISTRICTS
OF WASHINGTON STATE



transmission became necessary for hydroelectric plants located in remote mountain canyons far from the population centers.

The Pacific Northwest had helped pioneer the transmission line when the Willamette Falls Electric Company sent direct-current power 14 miles from Oregon City to Portland on June 3, 1889. The company soon converted to alternating current. Other increasingly higher voltage transmission lines followed. Most private electric companies in the Pacific Northwest originated about 1912 by using transmission lines to unite isolated, inefficient utilities into more efficient systems. The Hydro-Electric Power Commission of Ontario, formed in 1906, had long demonstrated the merits of a large, high-voltage transmission network.

In his somewhat romantic 1962 book *Insull,* Forrest McDonald tells how Samuel Insull formed the Public Service Company of Northern Illinois by using transmission lines to merge 39 isolated companies in August 1911. He called it "systematization." Within 4 years, he cut electric service rates in half. Insull's 1913 speeches dramatized what McDonald called the discovery of "a missing element in the economics of electric supply and in doing so contributed the most conspicuous part of the electrical revolution..." He concludes that systematization and rural electrification "were advanced almost a generation through the efforts of Insull."

As early as 1919, Professor Carl Edward Magnusson, Director of the Engineering Station, University of Washington suggested the merits of interconnecting transmission from British Columbia to Southern California.

The Seattle and Tacoma municipal electric systems built a transmission intertie in 1923. The Washington Water Power Company and Montana Power Company were interconnected the same year.

In related action that year, remembering World War I power shortages, Pennsylvania Governor Gifford Pinchot persuaded his State's Legislative Assembly to establish the Giant Power Survey Board. In its 1925 report, the board outlined a statewide 220,000-volt superpower system and strongly recommended rural electrification. Again because of World War I power shortages, Great Britain's conservative government in 1926 established the Central Electricity Board. It was authorized to build a transmission grid to integrate and standardize England's electric power supply.

At a hearing on the Umatilla Rapids bill January 16, 1931, Kenneth G. Harlan, a consulting engineer of Tacoma and Portland, was probably the first person to urge construction of Federal transmission lines to assure the public of receiving the benefits of low cost Federally generated power. In its 308 report of 1932 on the *Columbia River and Minor Tributaries,* the Corps of Engineers stressed the need for new 220,000 volt transmission lines.

On December 10, 1932 the Super Power Committee of Oregon reported to the legislature:

"Public power development has passed through the municipal ownership stage, and into the superpower or interconnection stage.

"The economics had through interconnection are so great that municipal ownership cannot survive unless all isolated public power plants are soon interconnected."

The transmission issue for Bonneville Dam came to focus in the 1934 *Report of the Bonneville Commission* to the Oregon State legislature. Would transmission facilities serve just the local area or the entire region? The seven Commission members split. The four-member majority report viewed Bonneville Dam as a local project with a trunk line to the Portland-Vancouver area to connect with existing lines of local companies and new lines of prospective large industries. The pro-Portland majority feared an extensive transmission system would result in higher cost power and deter industries from locating in the proposed service area.

Conversely, the three-member minority report stated "The market area for Bonneville power is taken as the entire Northwest." It urged, "Petition the United States to construct the interstate power transmission system, connecting all public and private plants in the Northwest." The minority report predicted Columbia River dams would develop faster due to expansion of electric power sales over the entire region. On the question of control the minority said:

"It is daily becoming apparent that the public must not only control the switch at the powerhouse, but also the power transmission network. The distribution lines may be in public or private ownership, as the people elect."

They also suggested:

"The economies available through ownership and operation of the transmissions network, because of diversity of streamflow conditions at connected powerplants and diversity of peakload conditions in various cities, is far greater than the economies which can be had through public ownership to the powerplant."

Another 1936 event warrants mention because of constitutional questions raised in considering whether the Federal Government could build and operate transmission lines. With fortuitous timing – barely a year before Congress considered the Bonneville Project Act – the United States Supreme Court on February 17 handed down its decision on the Ashwander case affirming the constitutionality of the Tennessee Valley Authority.

The timing of the decision served the Pacific Northwest well. The transmission issue, which is discussed in more detail in the next few chapters, had many ramifications, including creation of greater public awareness concerning the power transmission problem.

Carl Edward Magnusson

Professor Carl Edward Magnusson spoke out many times in testimony, speeches, and articles for a statewide and subsequently a regional transmission network. He emphasized the critical role of transmission in discussing the three functional divisions – generation, transmission, and distribution. At a Conference on Distribution of Bonneville Power at the University of Oregon March 18-19, 1937 he maintained:

"In the large majority of hydroelectric power developments long-distance transportation of the generated electric energy to market is in many respects of outstanding importance, primarily because ownership and control of the transmission lines form the basis for establishing and maintaining regional monopoly of the electric power business."

Magnusson included the statement in his subsequent presentation to the U.S. House Committee on Public Works. Regarding a Federal organization to administer the transmission system, he emphasized in his May 14, 1937 cover letter to the Committee:

"It is very important that the Administrator of the Bonneville and Grand Coulee power developments should be under the direction of either an administrator or a board primarily interested in power. Neither the United States Army engineers nor the United States Reclamation engineers possess the desired qualifications or point of view to successfully administer power developments like the Bonneville and Grand Coulee."

In any Pacific Northwest electric power hall of fame Professor Carl Edward Magnusson deserves an honored niche. Notably he helped to identify, explain, create awareness, and drive home the importance of the electric transmission issue. He envisioned and advocated basic principles for the Bonneville legislation. His 1919 prophecy of a West Coast intertie came to fruition a half century later.

The simplistic, vintage-1937 concept of electric transmission represents little more than a starting point for the long years of evolution and expansion toward the broader capabilities and greater benefits of the sophisticated, modern electric power pool and system of interregional transmission interconnections. In this evolution the Bonneville Power Administration would soon play a major role.

8. A TURNING POINT IN HISTORY

The Bonneville Act was a turning point in Northwest history.
– Roy F. Bessey in a 1975 Interview

The Pacific Northwest Regional Planning Commission played a crucial role in laying the foundation for a good bill. PNWRPC owed its origin to the National Industrial Recovery Act of June 16, 1933. The Act authorized the Public Works Administration to establish the National Planning Board. NPB in 1934 authorized and funded PNWRPC and contributed technical assistance and funds for state planning boards.

In the spring of 1935 Roy Bessey, PNWRPC executive director, Marshall Dana, first chairman of PNWRPC, and Senator James P. Pope of Idaho met with President Roosevelt to ascertain the President's wishes for instituting an organization to market the power soon to become available from Bonneville Dam, and later Grand Coulee Dam.

The President spoke glowingly of developing river basins, particularly the Columbia River Basin. He urged his visitors to study the problem of creating a power marketing agency with open minds. He called attention to such innovative organizations as the New York State Power Authority and Tennessee Valley Authority. He cautioned that a region's particular characteristics could render the valley authority approach unsuitable, and that such authorities could not fully substitute for regular departments. He agreed on the merits of a regional approach and the desirability of an early study.

The meeting prompted Secretary of the Interior Harold L. Ickes, as National Resources Committee chairman, to write an important letter on July 9, 1935 to PNWRPC:

Roy Frederic Bessey, left, and Frederic A. Delano.

"The National Resources Committee has been requested by the President to submit a report on the future of the Columbia Basin, which he is hoping will be helpful in determining the type of organization which would be set up for the planning, construction, and operation of certain public works in that area.

"The committee desires the assistance of the Pacific Northwest Regional Planning Commission for this work and requests your cooperation in securing a report for action by the advisory committee in Washington not later than November 1, 1935."

Ickes' letter set in motion a train of events which led ultimately to passage of the Bonneville Project Act of August 20, 1937.

The official legislative history of the Act covers only its enactment, not the numerous bills and preliminary steps in 1935 and 1936. Oregon Governor Martin complained in his April 22, 1937 testimony that 38 bills had been introduced. These years were characterized by slow development of public awareness concerning the transmission problem, gradual identification of specific issues, and eventual evolution of a compromise solution.

Had any quick action been taken, as requested by President Roosevelt, it probably would not have resulted in establishment of the Bonneville Power Administration.

In the usual legislative effort, the agency involved "carries the ball" for the Administration. The three agencies concerned – the Bureau of Reclamation, Corps of Engineers, and Federal Power Commission – had no incentive to be midwives for the birth of a new Federal agency, least of all the proposed Columbia Valley Authority. In view of this and other circumstances, BPA's birth had some miraculous aspects.

1935 Events The first legislative moves to market power from Bonneville Dam took place at the opening of the 74th Congress. On January 3, 1935, Washington Representative Knute Hill introduced H.R. 2790 to put the Bureau of Reclamation in charge of Columbia River development and power marketing, and to transfer Bonneville Dam upon its completion from the Corps of Engineers to the Bureau.

On January 14 Senator James P. Pope of Idaho introduced S. 869, and Representative Hill an identical bill in the House, to establish a Columbia Valley Authority (CVA). It would administer Columbia River development and take over Bonneville Dam from the Corps and Grand Coulee Dam from the Bureau.

Oregon Senators Charles McNary and Frederick Steiwer asked three Federal agencies – the Bureau of Reclamation, the Corps of Engineers, and the Federal Power Commission – to draft an alternative bill. On July 29 the Oregon Senators introduced the short S. 3330, and Washington Representative Martin Smith the same bill in the House. Its intent was to enable the Corps to operate Bonneville Dam, build main transmission trunk lines, and market and exchange power. The FPC would set rates. Oregon Representative Walter M. Pierce charged that the bill shortchanged the public.

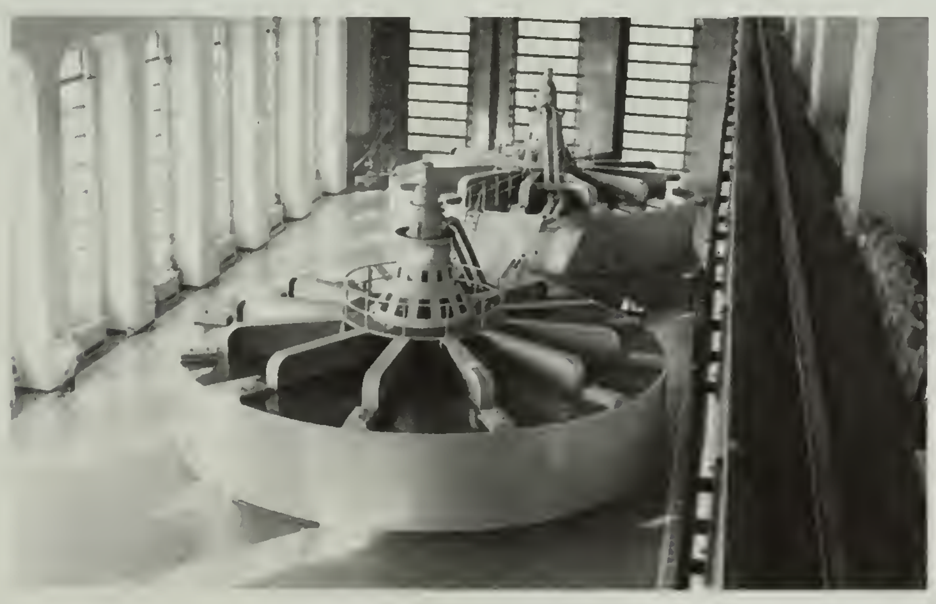
On the recommendation of the three agencies, President Roosevelt endorsed S. 3330 in a letter July 26 to Senator Royal S. Copeland of New York, Senate Commerce Committee chairman. In his 1973 book *Toward A National*

Power Policy, Dr. Philip J. Funigiello suggests Roosevelt had not paid close attention to the bill and may not have been aware that private utilities supported the bill and public power opposed it. Actually Roosevelt endorsed a different bill in each of 3 years. None went to hearings in 1935.

The bills before Congress that year served to polarize the transmission issue between advocates of a Columbia Valley Authority at one extreme and proponents of the sale of power by the Corps of Engineers at the generator bus or bus bar, or from two short trunk lines to Portland and Vancouver, at the other. The President asked Pope to shelve his CVA bill, saying there was "plenty of time" to consider a CVA.

While preparing the requested report for the President, the PNWRPC held public hearings September 5-30, 1935 at Helena, Spokane, Boise, Pocatello, Pendleton, Portland, and Seattle. Opinions were garnered on structuring an organization to plan, build, and operate major Federal public works in the Pacific Northwest. Chamber of Commerce witnesses dominated the hearings, generally to oppose a Columbia Valley Authority. Many witnesses assumed the Corps would market power from Bonneville Dam and the Bureau from Grand Coulee Dam. On the other hand statements from the Washington State Planning Council, Tacoma Chamber of Commerce, and Professor Magnusson urged establishment of a new unified Federal power marketing agency.

The hearings caused the PNWRPC concern because they disclosed that the public was unaware of the transmission grid issue, the uniform rate question, and the necessity for a regional approach. As in the case of the bills presented to Congress, the hearings stimulated public awareness and polarized proponents of differing viewpoints.



Bonneville Dam generators await transmission lines.

Deschutes River in flood. Flood control has been a major purpose of river basin development.

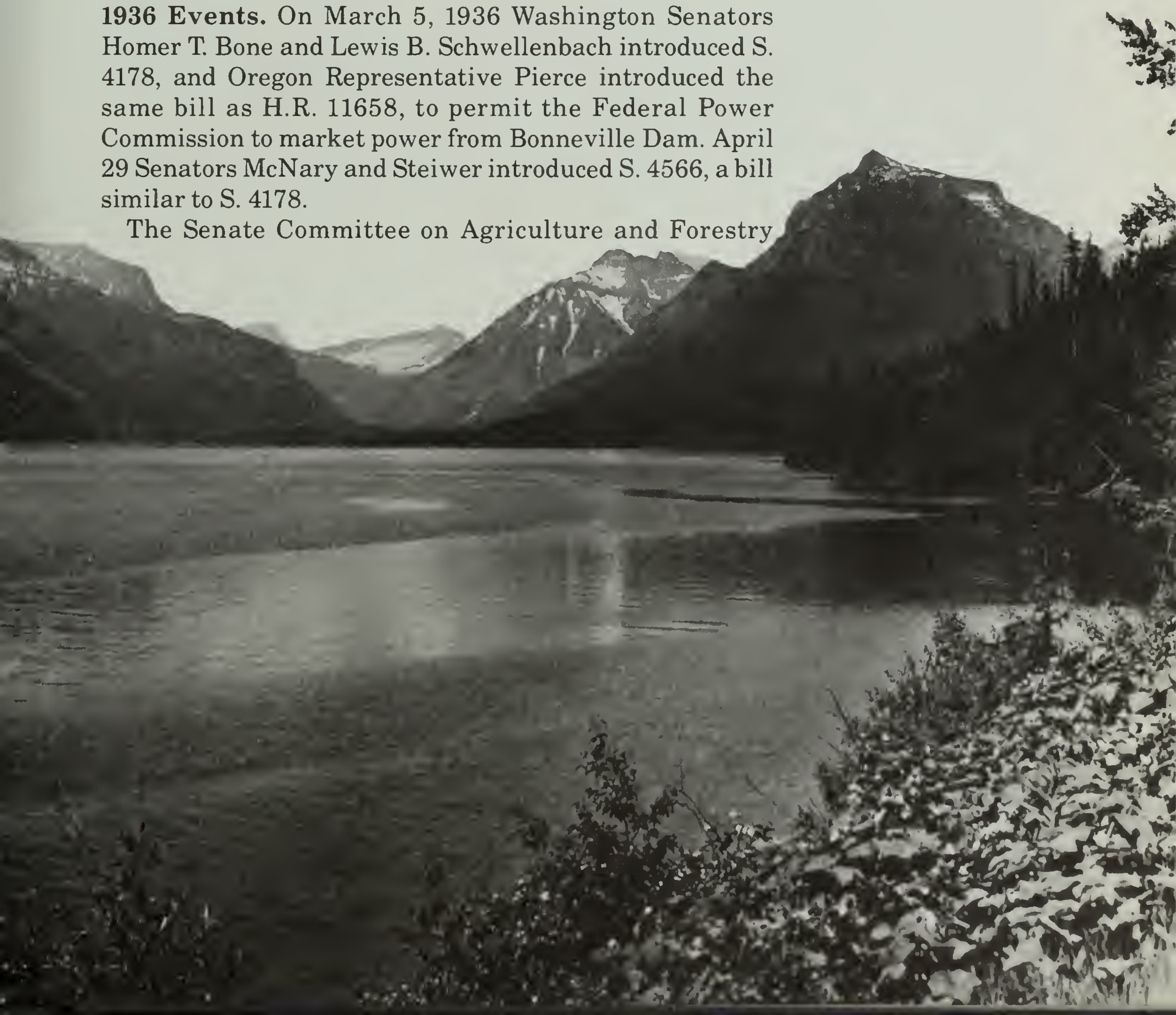
PNWRPC sent its monumental report to the National Resources Committee (successor to NPB) December 28. In effect, the report became a government "White Paper," supporting regionalism and establishment of a Federal regional power agency. It also made a strong case for regional planning. The mimeographed appendix of staff studies entitled *Columbia Basin Studies* was a valuable backup. The main report identified and evaluated five alternative kinds of power marketing organizations:

- both constructing agencies market power;
- select one existing agency to generate and market;
- create new agency to generate and market;
- create a Columbia Valley Authority; or,
- establish a Federal power corporation to generate and market power.

It recommended instituting a power corporation. Thus, by the end of 1935 the Administration had a carefully evaluated proposal and supporting arguments, but it was not published until May 1936.

1936 Events. On March 5, 1936 Washington Senators Homer T. Bone and Lewis B. Schwellenbach introduced S. 4178, and Oregon Representative Pierce introduced the same bill as H.R. 11658, to permit the Federal Power Commission to market power from Bonneville Dam. April 29 Senators McNary and Steiwer introduced S. 4566, a bill similar to S. 4178.

The Senate Committee on Agriculture and Forestry



Sources of the Columbia River include many lakes, both natural and artificial, which gather and store water and provide recreation, wildlife and scenic values. At lower left is Jackson Lake in Wyoming with the Teton Range. At lower right is Lake McDonald in Glacier National Park in Montana.
The former is a Ray Atkeson photo

conducted the first hearings on Bonneville power marketing May 7, 8, 9, and 13. The Committee was sympathetic because it had fought the long battle for TVA. It included Senator George Norris of Nebraska as chairman, and Senators Pope, McNary, Wheeler, and Schwellenback from the Pacific Northwest. The hearing focused on the PNWRPC report and the recommendation for establishing a Pacific Northwest power corporation.

Witnesses included Marshall Dana, PNWRPC chairman; Charles McKinley, PNWRPC consultant; Frederic A. Delano, chairman, and Charles W. Eliot II, executive director National Resources Committee; representatives of state planning boards; and James Delmage Ross, formerly of Seattle City Light and then Securities and Exchange Commission commissioner. The Committee also heard from W. D. B. Dodson, Portland Chamber of Commerce executive vice president, and Colonel Thomas M. Robins, Corps of Engineers North Pacific Division Engineer.

The 251-page Senate hearing transcript is a convenient reference, as it includes many documents such as the December 10, 1932 report of the Super Power Committee of Oregon, the December 29, 1934 report of the Bonneville Commission to the Oregon Legislature, and several useful PNWRPC memoranda outlining concepts for a regional power corporation.

The May 7 hearing opened with Delano's suggestion that Congress enact provisional legislation that year, leaving the next Congress to determine a more permanent law and organizational structure. This eventually led to the Bonneville Project Act becoming a provisional law.

On May 26 the four Oregon and Washington Senators cosponsored S. 4695 as a reconciled bill. It then went to the Senate Commerce Committee which reported it out with minor amendment June 5, 1936. The report included President Roosevelt's May 29 endorsement of the bill. Under the compromise bill the Corps of Engineers would sign power sales contracts subject to FPC approval.

Four representatives introduced S. 4695 in the House as almost identical bills, William A. Ekwall – H.R. 12873 and Pierce – H.R. 12875 on May 27 and Martin Smith – H.R. 12895 and Hill – H.R. 12899 on May 28. The House Committee on Rivers and Harbors held brief hearings on the four bills June 3, 4, and 8, and reported the bill June 8. The House and Senate bills died in the legislative logjam as Congress adjourned for the national political conventions and campaigns.

Meanwhile, early in 1936 the National Resources Committee reviewed the December 28, 1935 PNWRPC report and wrote a strong endorsement April 21, 1936. It then published the report and endorsement in May under the title *Regional Planning Part I – Pacific Northwest.*

Its publication was too late to influence the 1936 legislative process. Under the circumstances, the Pacific Northwest delegation could only try to secure passage of the old S. 4695. The busy Senate took up the bill June 6 and passed all the Senate Commerce Committee amendments. It was on the brink of final passage when objection was raised to inclusion of the Boulder Canyon project in it.

The City of Los Angeles and other Boulder Canyon Project power purchasers wanted a rider on the Bonneville Project Act which would reduce their power costs. In turn, this involved states in the Colorado River Basin. The controversy killed the bill for 1936.

1937 Events. Heartened by his election victory, President Roosevelt went to work on the matter of marketing Bonneville power. On January 18, 1937, he appointed an informal Committee on National Power Policy headed by Secretary Ickes. He asked for a report in two weeks, which Ickes, according to his diary, thought was "a pretty tall order."

Ickes called a meeting of his Committee and the Oregon and Washington Senators for January 25. He announced that the Committee felt the McNary Bill, which all four Senators had introduced, should be the basis for discussion. Ickes then explained to Senator Charles L. McNary his deep concern about the Corps of Engineers attitude on power. Ickes saw danger in allowing the Corps to have complete control. He asked McNary if he would insist on putting the Corps in charge of power marketing. McNary relented. That ended the stalemate.

The President received the Committee's report February 9, including a draft of the bill. Then he invited the congressional delegations from Oregon, Washington, and Idaho to the White House on February 18. The Committee on National Power Policy had endorsed the report of the National Resources Committee and the PNWRPC. Instead of a corporation, however, it preferred a bureau within the Department of the Interior under Ickes' jurisdiction. The Committee recommended the new bureau be in charge of operating the generation as well as building transmission lines for power marketing. The President explained that the controversial uniform rates question could remain open for the future administrator to resolve.

The next day, Representative Martin Smith of Washington introduced the bill as H.R. 4948. On January 5 he had introduced the 1936 bill as H.R. 92. On February 24 the President sent Congress a special letter enclosing the three-page report of the Committee on National Power Policy relative to marketing Bonneville power. Representative Nan Wood Honeyman of Oregon introduced H.R. 6151 on April 5, and Representative Pierce H.R. 6387 on April 14. Representative James W. Mott of Oregon introduced H.R. 6973 on May 11 and H.R. 7010 on May 12.

Representative Joseph J. Mansfield, House Committee on Rivers and Harbors chairman, called hearings on the bills March 9 to June 4. He introduced H.R. 7642 as a clean bill June 23, and reported it to the House June 24. The House passed it July 26.

Meanwhile, over the objections of Secretary Ickes, Senator Homer T. Bone proposed an amendment whereby the Corps of Engineers would be allowed to operate the power plant at Bonneville Dam. Senators Bone, McNary, Schwellenback, Steiwer, and Pope introduced S. 2092 in the Senate on April 5 containing the Bone compromise. The Corps had agreed to the compromise and testified in support of the bill. Commerce reported it out with amendments July 22. McNary had it recommitted to the Committee July 27 for removal of the extraneous Boulder Dam provisions, and reported it out again July 31. Striking Boulder Dam from the bill ended the objections that had killed the bill the previous year.

Dr. Daniel M. Ogden analyzed the politics of Columbia River development in his 1949 doctoral thesis. In the new Federal Department of Energy he served as the Director of Power Marketing Coordination involving the five Federal power marketing agencies.

The Senate substituted the language of S. 2092 for the House-passed H.R. 7642 on August 6, then passed the revised H.R. 7642 on August 9. This resulted in a conference committee and ultimate agreement. The President signed the Bonneville Project Act on August 20, 1937.

The growing popularity of the public power movement, as revealed in the Oregon and Washington election results of 1930, 1932, 1934, and 1936 in enacting PUD laws and forming PUDs, helped provide a political climate favorable to passage of the Bonneville Project Act. The President's difficulties due to the so-called court-packing proposal impeded the Administration's 1937 legislative program, but apparently did not hurt the Bonneville bill.

The Act came about as the result of a large effort by many people, named and unnamed. It especially benefited from the philosophical fatherhood of the PNWRPC, backed by the National Resources Committee, the Committee on National Power Policy, their staff personnel, and the President. The agreement between Secretary Ickes and Senator McNary broke the stalement. The Pacific Northwest's Congressional members distinguished themselves with their hard work throughout the 3-year legislative effort.

9. A CHARTER FOR POWER

...in developing electricity from this Bonneville Dam, from the Grand Coulee Dam and from other dams to be built on the Columbia and its tributaries, the policy of the widest use ought to prevail. The transmission of electricity is making such scientific strides today that we can well visualize a date, not far distant, when every community in this great area will be wholly electrified.

–Franklin D. Roosevelt
Speech Dedicating Bonneville Dam
September 28, 1937

A charter is an organic act. It is a law which creates an agency and tells it what to do. It is replete with policy, including the basic, threshold policy decision to create the agency.

The new law represented another milestone for Roosevelt, and, as it turned out, virtually the capstone for the New Deal power program. Key policies of the Act later became a nationwide power marketing policy in the Flood Control Act of December 22, 1944.

Basically, the Bonneville Project Act establishes the Bonneville Power Administration and serves as BPA's charter or organic law. The Act assigns responsibilities: the Corps of Engineers generates the power. The Corps installs and operates generators requested by the Administrator. The Administrator builds and operates transmission facilities, markets and exchanges power, negotiates power contracts, and proposes rate schedules. FPC makes the cost allocations and approves rates. These constitute the structural decisions of the Act.

A Cluster of Policies. The Bonneville Project Act constitutes a cluster of policies. Three short quotations illustrate the cluster idea and bring out most of the Act's major policies and supportive phrases that indicate policy:

"SEC. 2. (b) In order to encourage the widest possible use of all electric energy that can be generated and marketed and to provide reasonable outlets therefor, and to prevent the monopolization thereof by limited groups, the administrator is authorized and directed to provide, construct, operate, maintain, and improve such electric transmission lines and substations, and facilities and structures appurtenant thereto, as he finds necessary, desirable, or appropriate for the purpose of transmitting electric energy, available for sale, from the Bonneville project to existing and potential markets, and, for the purpose of interchange of electric energy, to interconnect the Bonneville project with other Federal projects and publicly owned power systems now or hereafter constructed.

* * * *

"SEC. 4. (a) In order to insure that the facilities for the generation of electric energy at the Bonneville project shall be operated for the benefit of the general public, and particularly of domestic and rural consumers, the administrator shall at all times, in disposing of electric energy generated at said project, give preference and priority to public bodies and cooperatives.

* * * *

"SEC. 6. ...The said rate schedules may provide for uniform rates or rates uniform throughout prescribed transmission areas in order to extend the benefits of an integrated transmission system and encourage the equitable distribution of the electric energy developed at the Bonneville project."

The major policies of the Act include: (1) encourage the widest possible use of electric energy; (2) operate for the benefit of the general public, and particularly domestic and rural consumers; (3) preserve the preference and priority for public bodies and cooperatives; (4) provide for uniform rates or rates uniform throughout prescribed transmission areas; and (5) set wholesale rates on the basis of actual costs, as determined by specific guidelines.

The Administrator is authorized to review and set resale rates to insure they are reasonable and nondiscriminatory. The Act does not mention interest or set an interest rate, nor does it specify an amortization period other than a reasonable number of years.

Certain phrases in the Act assist in interpretation, depending on the context: (1) benefits of an integrated transmission system; (2) encourage equitable distribution of electric energy; (3) to provide reasonable outlets; (4) prevent monopolization by limited groups; (5) as rapidly as markets may be found; (6) within economic transmission distance; (7) detailed instructions on preference; and (8) some guidelines for allocation of the cost of the dam.

Perceptions of Policy. Policies discussed previously led to dam building. This chapter begins with policies specifically for and by the Bonneville Power Administration.

President Franklin D. Roosevelt invited the Senators and Representatives from Oregon, Washington, and Idaho to the White House for a conference on February 18, 1937 on the proposed Bonneville legislation. He passed out copies of the tentative bill draft incorporating the recommendations of the National Power Policy Committee. He pointed out that the draft addressed four policy questions which had concerned him, and the draft answered each question in the affirmative.:

1. Should power from Bonneville Dam be marketed separately?
2. Should a new marketing agency be created?
3. Should the Federal Government construct the necessary new backbone transmission system?
4. Should preference be given to publicly and cooperatively owned distribution systems?

Another question as to uniform or zone rates was left to the Administrator provided that he encourage widespread use of the energy.

These five questions and answers represent President Roosevelt's perception of the major policies of what was to become the Bonneville Project Act.

Another perception of the policies of the bill appears in the 3-page report of the Committee on National Power Policy which the President transmitted to the Congress February 24, 1937. It ennumerated 7 points after explaining that the near completion of Bonneville Dam necessitated early legislation and that the form of administration therefore would be considered provisional or temporary:

1. Secretary of the Interior to appoint administrator who would consult with advisory board.
2. Administrator to dispose of energy as rapidly as markets could be found therefor, and to build transmission facilities to encourage widespread use and prevent monopolization.
3. Give preference to public and cooperative bodies.
4. Enter into 20-year power sales contracts.
5. Provide for review of wholesale rates by FPC, rates to be either on a uniform or zone basis.
6. Provide for administration, personnel, accounts.
7. Project to be self-supporting.

Other sources of policies for the Act included the report of the Pacific Northwest Regional Planning Commission, and the Tennessee Valley Authority Act. Bill drafters included Tom Corcoran, Ben Cohen, and Joe Swidler. Members of the Committee on National Power Policy provided ideas. Senator Homer T. Bone provided the amendment to provide for the Army to operate the generators. Interior Secretary Harold Ickes acted as chairman of the Committee on National Power Policy and probably played a role second only to that of the President.

Five weeks after signing the Bonneville Act, President Roosevelt journeyed to the Pacific Northwest to make a major address at the dedication of Bonneville Dam. With consummate patience he explained the desirability of a policy of widest use of electrical energy and of electrification of every community in the region. He favored decentralization of industry and the spread of people into smaller communities.

The speech had no appeal for his host, Oregon Governor Martin, conservative Democrat, or to Portland Chamber of Commerce members who had favored the sale of Bonneville power in the immediate local area. Nor did Governor Martin and his friends see merit in the many placards along the route to Bonneville Dam and at the dedication that read "We want Ross" for Administrator. Ickes appointed Ross two weeks later on October 10, 1937.

With the passage of the Bonneville Project Act the role of spokesman generally fell to the Administrator of the Bonneville Project. Creating a new agency was indeed an important threshold policy decision. The Administrators pictured the Act as a "bridge" for getting Columbia River power benefits to the people.

The Act's intent became reality in the hands of the first two Administrators. Ross urged quick resolution of the rate issue, the earliest possible start in constructing the Bonneville-Coulee intertie and general support for potential public power systems. A one-man whirlwind, his attempts to do more were cut short by his death.

When James Delmage McKenzie Ross (J. D. Ross) died suddenly March 14, 1939, his friend John Boettiger, the Seattle Post-Intelligencer publisher and President Roosevelt's son-in-law, wrote a tribute to him, saying:

> "He sought above all else to transmit the blessings of natural power into the service of mankind...to perfect the grid system by which the power of those projects will be delivered at low cost to homes and farms and factories over this whole Pacific Northwest."

As the first Administrator, Ross had had the advantage of being able to interpret the law or at least do what he felt the President would want him to do, such as adoption of the postage stamp rate policy. Ross set up the construction organization and began to build transmission facilities. As will be seen in later chapters Ross spelled out his program in the first BPA annual report, in his speeches, in testimony to Congress, in the employee bulletin, and in the correspondence. In fact he had begun to influence Franklin Roosevelt's ideas about power in 1931 while Ross was a consultant to the New York Power Authority. He had also testified on the proposed Bonneville legislation in 1936 and 1937. Probably his main distinguishing policy as Administrator was his forthright advocacy of public power. He was the only Administrator to do so, at least openly. In terms of effectiveness, especially in getting construction funds, Ross made good use of his visits at the White House.

The second Administrator, Dr. Paul J. Raver, assumed his duties September 15, 1939. Two weeks later on September 29 he told the Portland City Club his thoughts when offered the job:

"I saw the opportunity to extend the advantages of the Columbia River's tremendous power resources to the region...And, finally, I saw a chance to help in the big job of making America's greatest river serve all her people. It is a high privilege which I invite you to share."

On October 2 he talked to the Portland Chamber of Commerce about:

"...the broad economic development that will come from the wise use of this region's greatest single asset – the Columbia River."

Thus the first Administrators tried to portray the bureau as a bridge between Columbia River power plants and the people of the Pacific Northwest.

Raver was recruited by Ickes in part on the basis of Raver's investigations of the Insull utility empire. Chicagoan Ickes had no use for Insull. Raver came from Illinois where he was a recognized utility expert, teacher and just appointed Chairman of the Illinois Commerce Commission. He will be discussed in more detail later. He brought with him a number of outstanding division officers and assistants. They quickly became his Executive Committee and the core of a strong organization.

Raver's early perception of the Act was recorded in his address September 29, 1939, to the Portland City Club:

- encourage the widest use of energy by adopting the uniform rate concept;
- prevent monopolization by limited groups by building transmission lines;
- insure benefits to the general public, particularly rural and domestic consumers;
- grant preference and priority to public and cooperative systems;
- establish reasonable and nondiscriminatory resale rate schedules; and,
- provide 5 years' notice to private utilities to pull back power and insure an adequate supply for preference customers.

Raver emphasized in a speech at Reed College May 1, 1940, three main policies the Act imposed on him:

— encourage the widest possible use;
— prevent monopoly; and,
— preserve preference rights.

The Administrators had no easy job trying to explain they did not operate Bonneville Dam, did not generate any power, and the bureau office was not at Bonneville Dam. Unfortunately, they went by the title, Administrator, The Bonneville Project. Early in 1940 Secretary Ickes approved renaming the bureau "Bonneville Power Administration." But in the public mind the confusion with Bonneville Dam remained.

The confusion did not extend to President Roosevelt. In signing the Bonneville Project Act, he signed his own bill. His personal imprint was evident in almost all the policies and decisions. Throughout his presidency he took a personal interest in Columbia River development and construction of the transmission grid.

In his first year or two, Dr. Raver continued the Ross initiatives but moved more forcefully to build a strong and broader staff, assist new public power systems and build lines to transmit power to them, sign up industrial loads, and extend a fair hand to private utilities.

As later chapters will show, the emphasis and administrative styles and vigor of Ross and Raver probably reflected the support of President Roosevelt and Secretary Ickes as much as it did the Act.

The letter of the law, particularly the widespread use clause, has led to substantial interpretation, as will be shown in later chapters, notably on rural electrification, the Raver objectives, industrialization, a higher standard of living, conservation of natural resources, power exchange, irrigation, a better environment, and most recently conservation of energy. The Act has been cited as a factor in regionalism, increased job opportunities, economic decentralization, hydraulic and electrical integration, and influence as a yardstick.

The Act has served as the foundation for amendments and new laws. The cluster of policies interrelate and support one another, and comprise the Act's logic and philosophy. Since each policy exists in the context of the other policies, they do not lend themselves to isolation or separation from the Act. The Act as a whole constitutes the policy unit. Within this context, the next two chapters concern two major policies of the Act.

10. THE PREFERENCE CLAUSE

The preference clause is, most simply, a recognition that publicly owned resources belong to the nation's people and should be distributed directly to the people where it is possible to do so.

–Lee White
Former Chairman
Federal Power Commission

Five Preference Policies. In the Bonneville Project Act and the Flood Control Act of 1944 the Congress directs the Administrator to give preference to public bodies and cooperatives. The preference command appears in the Bonneville Act five times. The first is a strong, overall directive:

"SEC. 4. (a) In order to insure that the facilities for the generation of electric energy at the Bonneville project shall be operated for the benefit of the general public, and particularly of domestic and rural consumers, the administrator shall at all times, in disposing of electric energy generated at said project, give preference and priority to public bodies and cooperatives."

The language is not derived from any other act. It is an original Congressional finding regarding the purpose of the preference clause. For the first time, "priority" appears for emphasis.

The second command, section 4(b), requires that public bodies and cooperatives be given preference when there are competing applicants.

Third, section 4(c) allows public or cooperative bodies a reasonable length of time to secure financing to enter into the electric business.

Fourth, section 4(d) includes preference customers within economic transmission distance, allowing them a reasonable length of time to hold an election, organize, obtain financing, or otherwise become qualified electric energy purchasers and distributors.

Fifth, section 5(a) requires the Administrator to include a 5-year cancellation or "pull-back" clause in every contract with a nonpreference electric utility, if the energy may be needed to serve preference customers.

The preference clause appears more forcefully and at greater length in the Act than in any other law. In the Flood Control Act of 1944, for example, the preference language reads merely:

"Preference in the sale of such power and energy shall be given to public bodies and cooperatives."

History of Preference. Under the property clause of the

U.S. Constitution only Congress can dispose of public property such as public lands, war surplus, and Federally generated electric power. Congress has long shown its preference in making land grants for schools, homesteading, railroads, and to veterans. In 1877 it granted preference to water from public lands for irrigation. A list of 28 Federal laws which provide for preference appears at the end of this chapter. As the list shows, a weak form of preference began in 1906, for sale of surplus power incident to the Federal irrigation program. Dr. Martin Theodore Farris chronicles the history of the preference clause in his 1957 doctoral dissertation *The Economic Significance of the Preference Clause in Public Water Policy on the Development of the Pacific Northwest.* Its quotations and documentation sources are useful.

4¢ UNITED STATES POSTAGE
"GENTLE KNIGHT OF . . . PROGRESSIVE IDEALS" GEORGE W. NORRIS

The first strong preference clause appears in the TVA Act of May 18, 1933. The strength came from the conviction of Senator Norris, Senate Committee on Agriculture chairman, that the Corps of Engineers should not sell power from the Wilson Dam generator bus at Muscle Shoals to Alabama Power Company at dump power rates. Norris introduced 9 of the 16 Muscle Shoals bills reported out of committee from 1920 to 1933. Each of his bills contained the preference clause in much the same form as it appears in the TVA Act.

Senator Norris' convictions resulted from extensive study. He drove through the countryside of Ontario Province to visit farms electrified by the Hydro-Electric Commission of Ontario. He compared rates. He took part in the many electric power battles in the Senate. He helped launch the investigation of public utility holding companies in 1928. He helped make Nebraska the nation's only State served entirely by public and cooperative power agencies.

The TVA Act expanded the concept of preference three ways.

First, it included cooperatives. This paved the way for a thousand rural electric cooperatives across the country, which eventually provided political support for the preference clause. The Rural Electrification Act of 1936 gives preference to public bodies and cooperatives in applying for REA loan funds. The two kinds of preference, one on loan funds and one on power supply, complement each other in helping a new preference customer get into business. In his testimony on the TVA bill in 1933, Washington Senator Bone told of the success of the electric cooperatives that had purchased power at wholesale rates from Tacoma.

Second, the TVA Act authorized construction of Federal

transmission lines, thus giving potential preference customers direct access to the power.

Third, the Act directed the inclusion of a 5-year, pullback clause in contracts with nonpreference utilities. All three of these innovations became part of the Bonneville Project Act.

The Bonneville Act went beyond the TVA Act to broaden the meaning of the preference clause, as noted in the preceding section in this chapter on the "five preference policies." An extensive file of Regional Solicitor opinions, letters, and memorandums covering almost 40 years attest to the effectiveness of the Act's preference provisions.

President Roosevelt wrote the chairman of the House Committee on Rivers and Harbors on February 7, 1944 to urge inclusion in the next River and Harbor bill of a provision for integrated power marketing from Corps of Engineers hydroelectric dams by the Secretary of the Interior, along the lines of the Bonneville and Fort Peck Acts. It did not pass without challenge. A seesaw battle ensued all that year.

From November 22 to 24 the Senate debated the Bailey substitute amendment which called for selling energy at the generator bus or switchyard with no preference. It was defeated 27 to 44.

Congress finally included Section 5 in the Flood Control Act of December 22, 1944 to apply the Bonneville principles to all Corps of Engineers hydroelectric projects. It stated simply, "Preference in the sale of such power and energy shall be given to public bodies and cooperatives."

Kerosene oil for the kerosene lamps of America was for many years the main product from oil production. The lamps were smoky and smelly, requiring frequent adjustment and trimming of the wick and cleaning soot in the glass chimneys. With the coming of rural electrification the kerosene lamp was a favorite subject for conducting a mock wake or funeral.

This established a new high water mark for Federal electric power legislation. The Act provided much of the statutory authority for the Southwestern Power Administration, the Southeastern Power Administration, and, years later, the Alaska Power Administration.

Soon after the November 1946 election, Representative George A. Dondero introduced a bill to repeal Section 5 of the Flood Control Act of 1944 and direct the Corps of Engineers to sell power at the bus bar, exempting Bonneville. Additionally, Congress slashed appropriations for the Federal Columbia River Power System and severely reduced the BPA staff. Dondero charged in an article in the September 8, 1948 issue of *Public Utilities Fortnightly* that Communists and other radicals had been active in the field of power policy in the nation throughout the 1930s. He said the election of Thomas Dewey on November 2, 1948 would result in replacement of the Federal power administrators and changes in the laws to provide for bus bar energy sales from Federal dams without discrimination.

Another major challenge to the preference clause occurred in 1955 when the Georgia Power Company tried to purchase power from Clark Hill Dam by outmaneuvering the rural electric cooperatives that had no transmission facilities and were buying power from Georgia Power. The cooperatives had applied to the Secretary of the Interior for the power as preference customers. In an 11-page opinion July 15, 1955, U.S. Attorney General Herbert Brownell, Jr., confirmed the validity of the preference clause in the Flood Control Act. Notably, he relied on sections 4(b), (c), and (d) of the Bonneville Project Act to spell out the Secretary of the Interior's duties under the preference clause.

The last significant expansion of the preference clause occurred in the Niagara Redevelopment Act of August 21, 1957. As approved, the Act required the Federal Power Commission to condition any license issued the New York State Power Authority on reserving half the Niagara project energy output for preference customers, and to make up to 20 percent of this half available to preference customers in adjacent states. The transcript of the Senate debate May 14, 15, and 16, 1956 records many Senators' interpretations of the preference clause.

Planning the Act. The immediate legislative history of the preference clause in the Bonneville Project Act begins in the Pacific Northwest Regional Planning Commission's December 28, 1935 report. The preference idea appears three times, once at each level of the report. The last page of the staff report contains this brief item:

"Priorities in Sale of Power

"The provisions in section 10 of the Tennessee Valley Authority Act which set forth the priority rules to govern the sale of surplus power not used in the operations of Federal works ought to be embodied in the act creating the corporation we are proposing. These read as follows:

" '...the board is authorized to enter into contracts for such sale for a term not exceeding 20 years, and in the sale of such current by the board it shall give preference to States, counties, municipalities, and cooperative organizations of citizens or farmers, not organized or doing business for profit, but primarily for the purpose of supplying electricity to its own citizens or members: Provided, That all contracts made with private companies or individuals for the sale of power, which power is to be resold for a profit, shall contain a provision authorizing the board to cancel said contract upon 5 years' notice in writing, if the board needs said power to supply the demands of States, counties, or municipalities.' "

At the next level, the Commission's findings and recommendations includes:

"The obligation to accord to public and nonprofit agencies priority in the purchase of power."

Finally, the National Resources Committee reviewed and on April 21, 1936, endorsed the report. But it had some qualms, as indicated in its findings and principles:

"The prior right of cities, public-utility districts, cooperative organizations, etc., to the use of electric energy should be recognized in the law and policies of the proposed organization. It is doubtful, however, if the cancellation clauses enjoined by congressional statute upon the T.V.A. for contracts with private organizations will be wise in the case of the Pacific Northwest if, as we recommend, sufficient capital is made available to the corporation to install the additional generating units at Bonneville and Grand Coulee. If and when there appears to be an approaching exhaustion of the surplus electrical energy available from those public works, and if Congress fails to permit the construction of other river projects which will afford additional sources of electrical energy, then this cancellation clause provision might become appropriate. It is extremely important for the solvent operation of the corporation that all of the energy be utilized as rapidly as possible because the corporation's capital structure must include a large share of the total cost of the dams and if only a fraction of the power capable of being generated at these structures is used, capital charges will quickly eat up all the revenues and increase the early deficits so as to menace the soundness of the entire enterprise. What is necessary, therefore, is to safeguard the power operations so that the demands of public groups and cooperatives which may reasonably be anticipated may be amply satisfied while at the same time other users may be found who will aid in achieving a full utilization of these works at an early date."

This paragraph deserves careful reading in light of subsequent BPA history with respect to the preference clause and the policy on power sales to large industries. The Committee's conservative stance may have mirrored the political uncertainty facing the New Deal early in the 1936 election year.

The psychology had changed by November 3. The President had won reelection. The Democrats held more than three-fourths of the House and Senate. Washington State had created 15 more public utility districts.

The February 9, 1937 report of the President's Committee on National Power Policy detailed the preference idea more forcefully and at greater length than done before or since. The report consisted mainly of paragraphs from the Committee's proposed Bonneville Project bill.

The Committee rejected the National Resources Committee's recommendation to eliminate the 5-year pull-back clause in contracts with private electric utilities.

In briefing Congressional members from the Pacific Northwest, Roosevelt listed the preference to public bodies and cooperatives as one of the four major policy decisions of the proposed bill.

One minor ripple occurred in the House hearings April 22. Hamilton F. Corbett, Portland Chamber of Commerce president, proposed an amendment to delete "an allocation" and insert "the purchase" in what now is line one of section 4(c) of the Act. It would have weakened preference by limiting its applicability to only those public bodies and cooperatives immediately ready to sign power purchase contracts. It fell on deaf ears.

The Meaning of Preference. "All that the preference clause does is to prevent monopoly. It really should be called an antimonopoly clause."

Thus spoke Oregon Senator McNary in his 1940 campaign for Vice President. *Life Magazine* had asked freelance writer Richard L. Neuberger to interview McNary at Fir Cone, his farm near Salem. Years later the then Senator Neuberger recalled McNary with veneration. During the May 14-16, 1956 debate on the Niagara Redevelopment Act, Neuberger quoted McNary's concept of preference in response to critics of the preference policy.

Lawrence Potamkin, an attorney for rural electric cooperatives, often called attention to the semantic problem with the preference clause. It appeared to be discriminatory. He debated June 20-21, 1956 at Montana State University at Missoula on the subject, "Is A Preference Among Distributors of Federal Power Justified?" The 207-page transcript is the only published book on preference. It presented the views of three speakers for and three against the preference clause.

In his talk, "Preference Rights Are Ownership Rights," he stressed why preference constitutes proper and desirable discrimination. The owner of a car has the preference right to drive it. The nation's waterways belong to the people. Nonprofit transmission of the benefits and products of the public domain constitutes a superior public right over that of a corporation to impose a toll gate for private profit.

Early settlers in America had a strong aversion to toll gates due to fresh recollections of Europe's toll bridge evils. John Adams, the chief architect of the first Constitution of Massachusetts (adopted in 1780), provided some high-minded language for the bill of rights section:

"VI. No man, nor corporation, or association of men, have any other title to obtain advantages, or particular and exclusive privileges, distinct from those of the community, than what arises from the consideration of services rendered to the public;...

"VII. Government is instituted for the common good, for the protection, safety, prosperity, and happiness of the people and not for the profit, honor, or private interest of any man, family, or class of men;..."

Secretary of the Interior Julius A. Krug paraphrased this ideal 150 years later in these words:

"No person or corporation can be permitted to stand at the gate and levy toll on the product of our common public wealth."

In the mid-1940s Seattle City Light was negotiating with Puget Sound Power and Light Company for purchase of PSP&L facilities in Seattle. Meanwhile PSP&L and other private utilities offered to purchase BPA's remaining firm power. This led Administrator Raver to request an opinion on the meaning of preference as applied to the Seattle situation. BPA Acting General Counsel J. Kenneth Kaseberg issued a 15-page memorandum March 30, 1948 on the meaning of preference. Kaseberg concludes:

"I, therefore, conclude that the Administrator is required, both by the general policy expressed in section 4(a) and by the provisions of the succeeding subsections of section 4, to be in a position to meet the requirements of a public body which can reasonably be foreseen and that on the facts assumed, the possibility of the City's acquiring the Puget properties reasonably can be anticipated."

An attorney for a private electric utility issued a 14-page response April 20. It recommended BPA sell power to private companies to discourage the prospective acquisition by Seattle City Light of Puget Sound Power and Light within that city.

Seattle City Light's acquisition of the PSP&L electric system within Seattle in 1951 was the largest acquisition by a public power system in Pacific Northwest history. It transferred 78,000 customers and shifted the regional balance from 34 percent public power and 66 percent private power to 39 and 61 percent, respectively.

From that point forward Seattle City Light made solid strides in system improvement, lower cost service, and, by removing duplicating power lines, enhancing the attractiveness of the city. It reduced rates by $2.5 million in the three years following the acquisition. The preference clause had met a major test.

In his 1957 PhD thesis, Farris, who attended the debate at Missoula, discusses intended and unintended effects of the preference clause. Among effects intended by Congress, Farris lists the establishment and growth of new preference agencies.

Among unintended effects, he notes the large block of "residual" energy available at low rates to private utilities throughout BPA's early years. Preference customer energy purchases from BPA did not exceed those of private utilities until 1952. Farris suggests availability of this residual power enabled private utilities to avoid installing power plants, to reduce rates, strengthen their systems, and stop further sell outs of private power companies to public agencies.

The real proof of the BPA pudding has become apparent along the BPA service area's outer boundaries. In defining the BPA service boundaries, the Act of August 31, 1964 added a contiguous area 75 airline miles in width beyond the Columbia River watershed. BPA serves several rural electric cooperatives in this "fringe" area. The people there waited long years for power lines to reach them. They clamored for service, writing their Senators and Representatives in California, Montana, Nevada, Utah and Wyoming. Here the preference clause proved its worth through service to people in remote rural areas. It had the effect of strengthening BPA at its boundaries.

Participating in the Missoula debate, the author of this history, then Executive Secretary of the Northwest Public Power Association, listed 10 beneficial effects of the preference clause.

The preference clause —

— facilitated rural electrification;

— reduced electric rates;

— stimulated increased use of power;

— stimulated the formation and healthy growth of electric cooperatives and public agencies;

— facilitated the Congressional program of multiple purpose comprehensive development of water resources;

— increased national defense productivity;

— increased gross national product;

— increased Federal tax revenues;

— strengthened local units of government; and,

— checked the electric utility monopoly.

This list suggests the broad, fundamental nature of the preference clause, its many meanings and effects. Later chapters illustrate how the preference clause facilitated widespread use of power and helped mitigate the problem of insufficient power supplies. The preference clause has helped provide low cost electric service to the people and especially those economically disadvantaged by the lack of power.

STATUTORY BASIS FOR PREFERENCE TO PUBLIC BODIES IN MARKETING FEDERAL POWER

Act of March 3, 1877 (Reclamation).
April 16, 1906 (34 Stat. 116, 117) (Reclamation).
December 19, 1913 (38 Stat. 241) (Raker Act).
June 10, 1920 (41 Stat. 1063, 1067) (Federal Water Power Act).
September 18, 1922 (42 Stat. 847) (Salt River Project Act).
December 21, 1928 (45 Stat. 1057, 1060) (Boulder Canyon Project Act).
May 18, 1933 (48 Stat. 58, 64) (Tennessee Valley Authority Act).
May 20, 1936 (49 Stat. 1363, 1365) (Rural Electrification Administration Act).
August 20, 1937 (50 Stat. 731, 733) (Bonneville Act).
May 18, 1938 (52 Stat. 403, 405) (Fort Peck Act).
August 4, 1939 (53 Stat. 1187, 1195) (Reclamation Project Act).
October 14, 1940 (54 Stat. 1119, 1124) (Water Conservation and Utilization Act).
December 22, 1944 (58 Stat. 887, 890) (Flood Control Act, 1944).
March 2, 1945 (59 Stat. 10, Sec. 2) (River and Harbor Act, 1945).
June 18, 1954 (68 Stat. 255) (Falcon Dam – Transmission and disposition of electric energy produced).
August 30, 1954 (68 Stat. 919, 929, 954) (Amendment to Atomic Energy Act).

The following acts or Executive Orders provide for preference relative to the sale of power, power privileges or power facilities.

Executive Order 9353, 8 F.R. 8587; Executive Order 9366, 8 F.R. 10699; Executive Order 9373, 8 F.R. 12,001 (all 1943).

Surplus Property Act of 1944, Section 13(d), Act of October 3, 1944, 58 Stat. 765. Codified in 50 U.S.C. Appendix 1622 (D).

Eklutna Project Act of July 31, 1950, 64 Stat. 382.

St. Lawrence Seaway, Public Law 358, 83rd Congress, 2nd Session, July 6, 1954.

Coosa River, Public Law 436, 83rd Congress, 2nd Session, June 28, 1954.

Markham Ferry Dam, Public Law 476, 83rd Congress, 2nd Session, July 6, 1954.

Priest Rapids, Public Law 544, 83rd Congress, 2nd Session 68 Stat. 573, July 27, 1954.

Canyon Dam – Flood Control Act of 1954, Public Law 780, 83rd Congress, 2nd Session, 68 Stat. 1248 September 3, 1954.

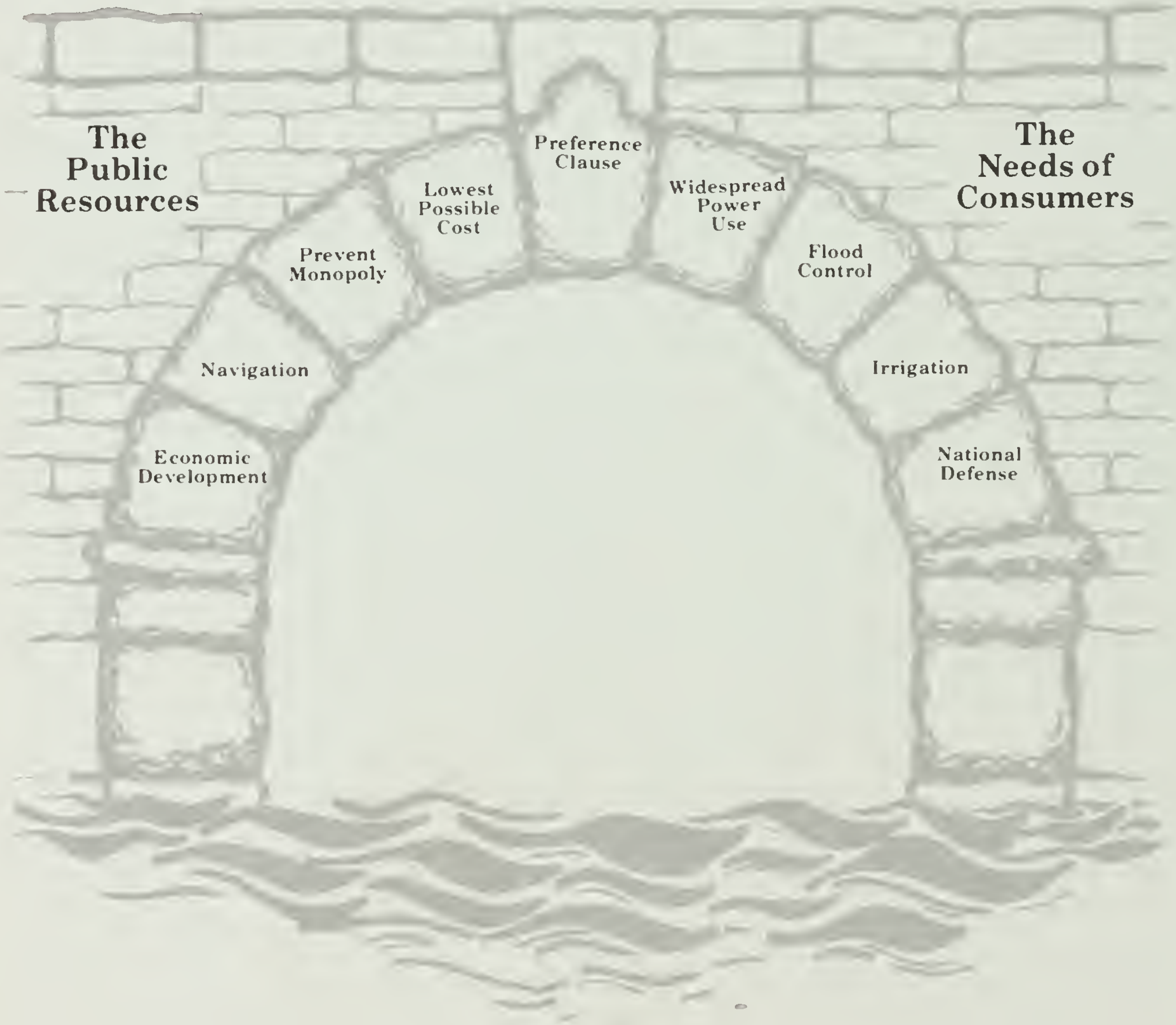
Central Valley Project Act of August 12, 1955.

Small Reclamation Project Act of August 6, 1956.

Niagara Redevelopment Act of August 21, 1957.

Flood Control Act of July 30, 1958.

FEDERAL HYDROELECTRIC LAWS



11. POSTAGE STAMP RATE POLICY

The key to rural electrification in the Northwest has been 'Bonneville power' and the postage-stamp rate, a rate that is the same wherever power is delivered, regardless of the distance from the source.

– Marquis Childs

The uniform rate policy, once called the "blanket rate," and now the "postage stamp rate policy," was the focal point of a major controversy from 1935 to 1938. Under a uniform rate the cost of power is the same regardless of the distance of customers from the dam. The alternative, "rates uniform throughout prescribed transmission areas," meant a zone rate. For example, the base rate might apply within 50 miles of a dam, and increase by half a mill per kilowatt -hour each concentric 50-mile zone. In this example, the rate would be "uniform" within each zone.

The historical basis for the uniform or blanket or postage stamp rate policy dates from the 1935 Pacific Northwest Regional Planning Commission report on the *Columbia Basin Study,* formally known by the title *Regional Planning Part I – Pacific Northwest.*

The Portland Chamber of Commerce and its allies had advocated a low generator bus or bus bar rate for power from Bonneville Dam, or perhaps some free transmission line service as far as the Portland-Vancouver area, to entice industry exclusively to that local area.

At the PNWRPC meeting March 2, the Portland Chamber of Commerce presented a resolution urging that Bonneville power be sold at a very low rate to paper mills. The PNWRPC responded by adopting a policy:

> "Be it resolved, that all such projects so submitted shall be referred to the planning consultant of the commission, and its staff, for investigation and report before the commission takes action."

People in the remainder of the region, particularly throughout Oregon and Washington, disagreed with Portland's proposal. Generally, they envisioned the interconnection of Bonneville and Grand Coulee Dams and future Columbia River dams in a regionwide transmission grid. The regionwide postage stamp rate was strongly supported by rural people and by existing and prospective public power systems.

The rate controversy actually involved many policies and objectives. The Portland proposed bus bar rate for big industries and private power companies was viewed as a way of keeping the lid on the incipient public power movement, and thus symbolized the private versus public power issue. Planners saw the rate question as centralization and urban congestion versus decentralization and regionwide benefits. Farmers saw it as rural electrification and a better standard of living versus rural drudgery and hardship.

The postage stamp rate idea did not spring forth full grown like Athena from the head of Zeus. Its birth was laborious. The PNWRPC and its staff analyzed other large power grids. The analysis indicated the merits of a regionwide transmission grid and uniform wholesale rate. This view was expressed in the December 28, 1935 PNWRPC report, which the National Resources Committee endorsed after extensive review. The NRC endorsement includes the following explanation and justification for recommending a uniform rate:

> "It would appear that a wise national policy will see to it that this new resource is so distributed as to achieve the maximum regional and national benefit. That requires that the surplus electric energy from Bonneville, Grand Coulee, and such future federally financed public works on the Columbia River and its tributaries as may be built shall become available to the greatest number of people at the lowest practicable rates consistent with the solvency of the works used for generation, transmission, and distribution of such energy. It follows that the operating agency should adopt a policy for the sale of electricity which will make rates similar over large areas, which will pass along the economies in the prices of wholesale power to the ultimate consumer, and which will contribute, insofar as may be wise, to the stabilization of existing communities, the appropriate decentralization of new industries, the increase of steady employment, and the increased consumption of electric energy by farmers and domestic consumers."

This photograph was taken by a salesman for electric milking machines. Both the woman and the cow are giving him the skeptical look.

This philosophical paragraph caught the eye of Senator McNary. He was then Senate Minority Leader and a member of the Senate Committee on Agriculture and Forestry which opened the first hearing on marketing Bonneville power May 7, 1936. He had supported the Portland Chamber of Commerce viewpoint, as evidenced in the McNary-Steiwer bill, S.3330, introduced in mid-1935.

The hearing emphasized the PNWRPC report on the Columbia Basin. The Committee had invited witnesses familiar with the report. Frederic A. Delano, National Resources Committee Advisory Committee chairman, was the first witness. McNary promptly launched into four pages of questions on the feasibility of transmitting electricity 300 miles, which would include northern California. He asked whether Delano envisioned the same wholesale rate for northern California as for Portland. Delano concluded:

"We favor, in general terms, as shown in this paragraph that the Senator just read – we favor what might be called the blanket rate system."

From this somewhat strained encounter, Delano's relationship with McNary improved. He occasionally visited McNary's office in Washington, D.C., and visited him at Fir Cone during a trip to the Pacific Northwest.

Traditionally, the Portland Chamber of Commerce used McNary's office as its Washington, D.C., headquarters. In the Senate Committee hearing two days after Delano's appearance, W. D. B. Dodson, Chamber executive vice president, referred to Bonneville Dam:

"We feel we have a paternal position on this, Mr. Chairman. We fathered this project. We have listened to the experts as they take up our child and diagnose it, offer to take out its heart, possibly to put it back, and you can see we are deeply concerned as to whether the child will live after they get through."

Dodson obviously had no love for the PNWRPC or Delano.

"If we are going to sell that power in any reasonable time, it cannot be done except a heavy part goes to industry. If we are to get certain heavy industries, we cannot have these gentlemen of the Planning Commission come in here and say, 'Don't locate any industry in the gorge. You might deface that gorge in some way or another.' "

On the last day of the hearings, May 13, when Senator Pope asked for his views on a uniform rate, Colonel Robins, North Pacific Division Engineer of the Corps of Engineers, replied:

"I don't know that it is economically feasible at this time, Senator. It costs money to transmit power, and if you superimpose an enormous transportation system or grid over that country with its present small population, relatively speaking, and large distances that you have to cover, and average up the cost so that it is the same all over, it will make your cost so much that you will never be able to sell it to industry, and if you don't get industries, you don't get people, and if you don't get people you can't sell power. You have got to have people to consume power. You can't sell power to jack rabbits or in a country that is not populated."

Apparently neither the PNWRPC report nor the hearings on it made much of an impression. On May 26 the four Washington and Oregon Senators introduced their reconciled bill S. 4695. They obtained a quick, favorable report through Senator McNary from the Senate Commerce Committee on June 5. The House held hearings on the bill June 3, 4, and 8, and reported it to the House on June 8. The bills died due to the rush of adjournment and to the extraneous Boulder Canyon rider. This ended the FPC-Corps of Engineers bill and McNary's efforts on its behalf.

The sheepherder's cook wagon is heading for the high elevation of Boulder Creek Valley, one of thousands of remote unelectrified valleys of the Pacific Northwest. With the advent of rural electrification many remote areas were able to use electricity to develop ski resorts, farms, recreation camps and summer homes.

President Roosevelt, concerned about early completion of Bonneville Dam, sent his September 8 letter asking the Federal Power Commission to recommend a rate structure suitable for marketing Bonneville power. He concluded with these words:

"In this connection, I wish to remind you that the advisory committee of the National Resources Committee in its report on this general subject laid special emphasis on the importance of a rate structure which will not lead to the future congestion of industry close to generating units, but in preference distribute the benefits of the Columbia River over as wide an area as practicable. In the opinion of the committee a system like the English grid or that adopted by the Tennessee Valley Authority would be desirable and should at least have the careful consideration of the Federal Power Commission."

Under the urgency of the near completion of Bonneville Dam and in the wake of the November election's Democratic landslide and supportive vote for public power in Washington State, President Roosevelt moved decisively. He met with the Northwest delegation February 18, 1937, and sent Congress a special message February 24, based on the PNWRPC report that suggested the feasibility of a uniform rate. Representative Martin Smith of Washington introduced the Committee on National Power Policy's draft of the proposed Bonneville Project Act as H.R. 4948.

The sporadic hearings of the House Committee on Rivers and Harbors from March 9 to June 4 resulted in the introduction of H.R. 7642 June 23, and a favorable report to the House on June 24. Oregon Governor Martin testified April 22:

"Some testimony was presented last year that Bonneville energy should be transmitted all over the Pacific Northwest. What damn nonsense! Excuse me; I got off my paper. (Laughter.)"

Later that afternoon Corbett, Portland Chamber president, recommended an amendment to substitute for the sentence on uniform rates:

"The rates to be charged for electric energy sold by the administrator pursuant to this act may be uniform through transmission areas to be prescribed by the administrator with the approval of the Federal Power Commission, but all such rates shall bear a reasonable relation to the cost of producing and transmitting the electric energy so sold."

In contrast, Oregon Representative Pierce and others urged the uniform rate policy be required in the law. Professor Magnusson particularly advocated a uniform rate approach.

Perhaps in deference to Senator McNary and others, President Roosevelt thought the uniform rate question should be left open for future determination by the administrator, provided the Act contained criteria for guidance. The Bonneville Project Act read:

"The said rate schedules may provide for uniform rates or rates uniform throughout prescribed transmission areas in order to extend the benefits of an integrated transmission system and encourage the equitable distribution of the electric energy developed at the Bonneville project."

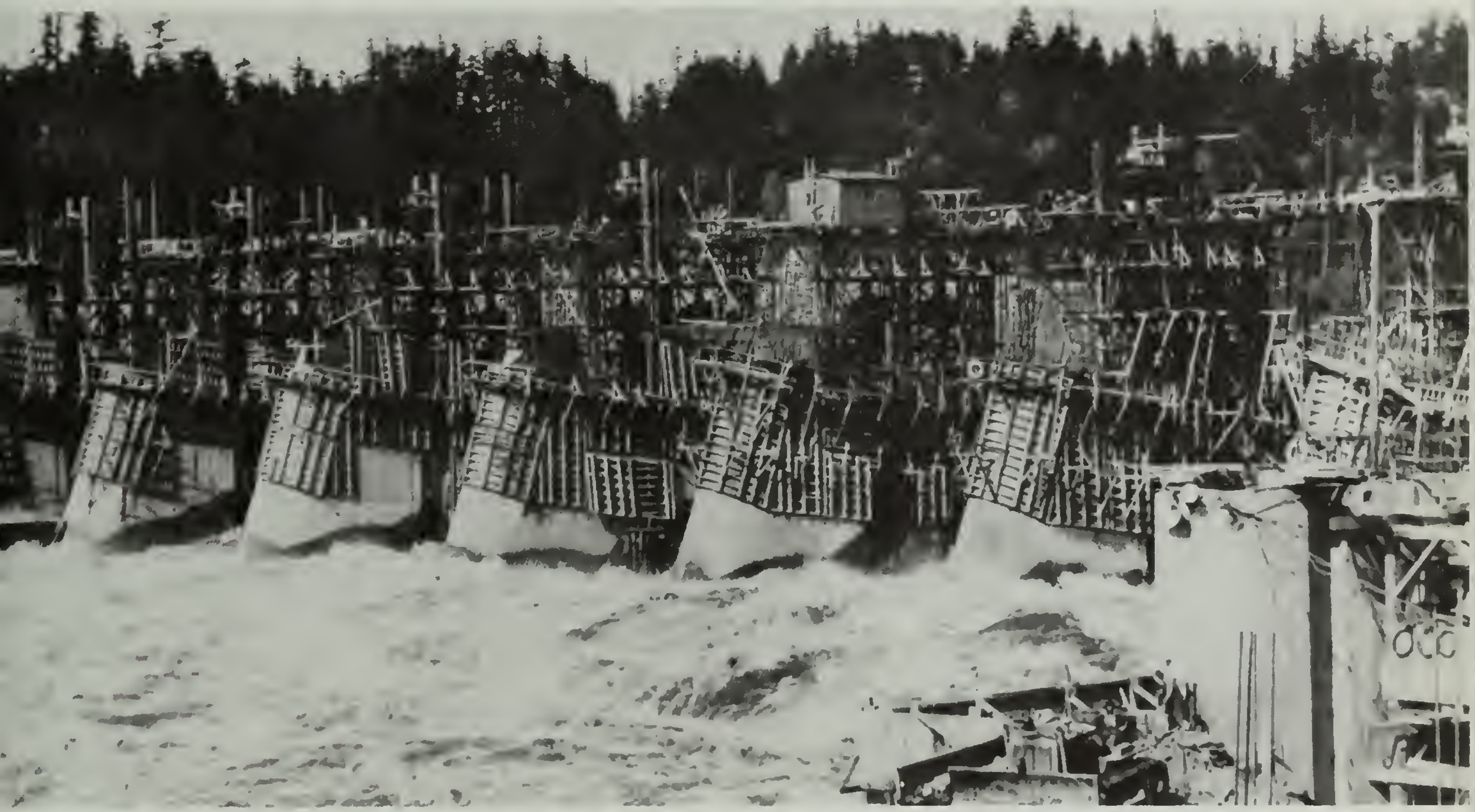
Repeatedly from his first visit to the Pacific Northwest in 1920, President Franklin D. Roosevelt came back to see the progress of construction. Shown here is construction of the spillway at Bonneville Dam.

The Federal Power Commission greatly assisted new Administrator Ross. In response to the President's September 8, 1936 rate study request, the FPC issued a lengthy report in March 1937, revised in August 1937, proposing a uniform rate for a market area along the lower Columbia River some 300 miles long and 200 miles wide.

The FPC issued an interim cost allocation for Bonneville Dam on February 8, 1938. This set the stage for Ross to move. He mailed out thousands of questionnaires March 10. The gist of the six specific questions was: Should Bonneville power be sold at the generator bus primarily to industries in the immediate vicinity, or should transmission facilities be built to encourage widespread use of electricity throughout the Pacific Northwest?

Accompanied by FPC Commissioner Claude Draper, Ross conducted public hearings March 10 through March 18 in eight cities in this order: Salem, Olympia, Boise, Walla Walla, Pendleton, Spokane, Yakima, and Portland. Some 80 percent of the testimony in the 440-page transcript supported the postage stamp rate. By the time Ross returned to Portland for the final hearing, the region already had spoken in favor of a regional transmission grid and widespread use of electricity.

Ross chaired the meetings, answered questions, helped witnesses, and missed no opportunity to explain electricity. At the Portland hearing, Franklin T. Griffith, Portland General Electric Company president, submitted a 20-page statement offering to pass on to consumers any Bonneville power benefits. At the afternoon session, Corbett read a 20-page statement emphasizing the Portland Chamber's 25-year battle to get Bonneville Dam started. He stressed the need for low rates to attract industry, but denied the Chamber was opposed to building transmission when economical. Oregon Grange Master Ray Gill closed the hearings with a 10-page statement endorsing the postage stamp rate.



Administrator Ross decided to adopt a uniform $17.50 per kilowatt-year rate for power anywhere along the transmission system, and $14.50 per kilowatt-year within 15 miles of the dam, when the customer furnished the transmission. The FPC approved the rate schedules June 8, 1938. The $17.50 rate, 2 mills per kilowatt-hour, was in effect 27 years. The kilowatt-year rate as such was discontinued in 1974.

Colonel Robins and others had called attention at the hearings to industry contentions that rates needed to be ½ mill or 1 mill per kilowatthour to attract industry. Yet, the 2 mill rate did attract industry providing thousands of jobs, hundreds of millions of dollars of new investment and tax base, and a more stable economy which contributed to a better standard of living.

Since the $17.50 rate, BPA has adopted many rates, rate changes, and rate combinations. The postage stamp principle has survived.

During World War II, the Federal Government enjoyed the savings from low cost power for Hanford, military installations and defense production. Those benefits continued in peace time. The greatest benefits from Federally generated low cost power went to the residential, commercial, industrial, and public users of the region. The result has been a stronger regional economy and a higher standard of living. In time, California would also be a major beneficiary. Other multi-purpose benefits, flood control, navigation, and irrigation, have enriched the region and the Nation.

Two points bear mention here in relation to the postage stamp rate policy. First, the dire predictions proved erroneous. BPA pooling of all loads and resources provided the greatest opportunity for effective and efficient power management and the sale of power throughout the region. The region was able to provide low cost power for both rural electrification and large industry and meet full repayment requirements.

Second, the results or benefits from the BPA program rarely can be attributed to any one policy. The policies inter-relate. The previous chapter suggests the preference clause enabled BPA to serve rural customers in fringe areas. Actually that was possible because of the whole cluster of policies, such as uniform rates, encouraging widespread use, serving customers within economic transmission distance, benefiting the general public, particularly rural and domestic consumers, and others. The Administrators and Congress deserve credit because their decisions not only established the policies but also provided the appropriations and facilitated implementation of the policies.

12. RELATIONSHIP WITH THE FEDERAL POWER COMMISSION

When I use a word, Humpty-Dumpty said, it means just what I choose it to mean – neither more nor less.

– *Lewis Carroll*

Policy takes many forms, beginning with the structure of government. The Bonneville Project Act is an organic law because it creates a new agency and serves as its basic charter. The Act then defines the structural relationships with the FPC and the Corps of Engineers. Other relationships would evolve administratively notably with agencies making up the Federal Power Program. Structure and structural relationships constitute policies.

The 1937 Act came in against a congressional background of 50 years' experience debating electric power issues, conducting investigations, and enacting power laws. By 1937 the Congress had assigned power responsibilities to six agencies, in order of age: Army Corps of Engineers, Bureau of Reclamation, Federal Power Commission, Tennessee Valley Authority, Securities and Exchange Commission, and Rural Electrification Administration. BPA would soon have relationships with all six, and with others such as the U.S. Forest Service, Bureau of Land Mangement, GSA, GAO, Departments of Justice and Treasury, and AEC (ERDA/DOE). For 40 years, BPA was part of the Department of the Interior before transfer to the Department of Energy in 1977. Since each agency's policies and viewpoints can influence other agencies, such relationships often become a policy source. This chapter illustrates this broad area, using the FPC relations as an example.

The Federal Power Commission's involvement with Bonneville power marketing began in 1935, well before BPA originated. The FPC played an important role in the 1935-38 period to help BPA establish a viable organization. Through the cost allocation process the FPC has influenced the interest rate, repayment period, and allocation of project investment to power.

The FPC pulled a surprise in 1974 by asserting more authority over BPA wholesale electric rate schedules than previously exercised. In fact, it claimed authority which it long had insisted it did not have. In 1974 FPC sought to enter into questions regarding the form of BPA wholesale rates. BPA contended that FPC should confine its review of BPA to the clear wording of the laws, both the 1937 and 1974 Acts, namely, to approve or disapprove the level of rates in order to insure repayment of the Federal investment. In such a controversy a review of the legislative history may provide a useful perspective.

The FPC had little authority until 1935. Under the Federal Water Power Act of 1920, the FPC had a perfunctory role limited to licensing hydroelectric projects.

On August 26, 1935, President Roosevelt signed the Public Utility Act, which consisted of two laws. Title I was the Public Utility Holding Company Act which the Securities and Exchange Commission has administered. Title II was the updated three-part Federal Power Act, which included two entirely new parts: Part I strengthened and reenacted the previous Act but eliminated the old title. Part II declared electric companies to be public utilities affected with the public interest. It authorized the FPC to regulate electric utility companies engaged in interstate commerce. It included section 202 on interconnections and coordination. Part III, concerned proper accounting procedures, requirements as to records, reports, FPC rules and regulations, court review, and enforcement authority, including fines and forfeitures. The Act empowered the FPC to be a strong regulatory commission.

Meanwhile, S. 3330, the so-called Army-FPC bill introduced July 29, 1935, would have enabled the Corps to operate Bonneville dam and one or two trunk lines and market the power. It authorized the FPC to make cost allocations, fix wholesale rates, set resale rates, approve sales contracts, advise the Corps on when to install additional generators, approve contracts for power exchanges, provide a uniform accounting system, and determine reserves needed for replacements. S. 3330 would have given the FPC a major role in policy making and management of the power marketing function at Bonneville Dam. The compromise bill, S. 4695 and H.R. 12873, introduced in 1936, would have strengthened the FPC's role, but would have authorized the Corps to sign power sales contracts. A House Committee amendment placed responsibility for cost allocations on the Comptroller General of the United States. It was still the Army-FPC bill.

The Pacific Northwest Regional Planning Commission did not endorse the Army-FPC bills. The December 28, 1935 staff report on the Columbia Basin Study suggested using only FPC depreciation rules and FPC advice on rates and contracts. The staff proposed to give FPC only a minor role, and suggested a separate board allocate costs, and the annual audit be made by a commercial auditing firm instead of the U.S. General Accounting Office. The National Resources Committee supported the PNWRPC recommendations that the FPC serve as an advisor on rates and contracts and the FPC accounting methods be used. It suggested that FPC perform the audit.

The Committee on National Power Policy, which included FPC Chairman Frank R. McNinch, recommended setting up a Bonneville Advisory Board with one member representing FPC. It called for FPC approval of rates and use of the FPC accounting system. It was silent on cost allocations.

S. 2092, introduced April 5, 1937, would have required the FPC to make cost allocations, approve rates, and serve on the advisory board. Other bills offered alternatives on handling cost allocations. H.R. 92 of January 5 specified that the Comptroller General allocate costs, and H.R. 6387 of April 14 that the Administrator allocate costs, subject to the FPC's approval.

The FPC wrote similar letters to the House Committee on Rivers and Harbors May 3 on the House bills, and May 10 to the Senate Committee on Commerce on S. 2092. The letters concerned division of the responsibility between the Administrator and the FPC for setting electric rates. The FPC objected in its May 10 letter to S. 2092 authorizing the Administrator to prepare the proposed wholesale rate schedules, and FPC to approve them, and added:

"Further, the bill gives the Federal Power Commission no authority to modify rate schedules submitted by the Administrator but only a veto power over the rate schedules submitted. This places the Commission in an impossible position as a regulatory agency over rates."

The letter recommended that the FPC:

"...either be relieved from any responsibility in connection with rates charged, or that its control over rates be made adequate, effective, and complete if, in the opinion of Congress, it should be charged with this responsibility."

Secretary Ickes testifying on the House side May 10 noted the FPC's objections and proposed an amendment to strengthen the FPC's authority. The last sentence of the Ickes Amendment read (p. 144):

"If any rate schedule submitted by the Administrator is not approved by the Federal Power Commission, the Federal Power Commission may revise such schedule in conformity with the standards prescribed by this Act, and as so revised such schedule shall become effective."

Secretary Ickes said this would give the Administrator the responsibility for initiating the rate schedule and the final authority to the FPC.

H.R. 7642, introduced June 23 as a clean bill, included the Ickes Amendment. It was passed by the House on July 26 (Congressional Record, July 26, 1937, 7613 and 7624).

Had the Ickes Amendment become part of the Act, it would have raised substantial questions because it provided for the rate schedules to be initiated only by the Administrator, and would have enabled FPC to change them in accordance with standards prescribed by the Act.

Despite the FPC's strong letter, Congress did not modify S. 2092 with respect to wholesale rates or cost allocations. Senator McNary included the FPC letter verbatim in the Senate Commerce Committee Report (No. 919, 75th Congress, 1st Session, July 22) in recommending that S. 2092 be passed. The section of the bill concerning wholesale rates, which the FPC had disputed, was enacted unchanged as part of the Bonneville Project Act.

On August 9 the Senate substituted the language of S. 2092 for the House-passed H.R. 7642, thus striking the Ickes Amendment. The Senate passed S. 2092 and requested a conference with the House. The Conference Committee adopted the Senate version, and added two minor amendments. The House and Senate each adopted the Committee Report August 12. As approved, the Act provided a drastically reduced, minimal role for FPC compared to expectations in the Army-FPC bills of 1935 and 1936.

Coincidentally, Congressman Pierce was scheduled to make an extensive speech in the House on May 12. But he was ill. Congressman John Rankin obtained unanimous consent for printing the Pierce speech in the Congressional Record (p. 4431-4443).

Pierce claimed the bills before Congress generally were based on President Roosevelt's February 24 message calling for the Bonneville Project Act. But, he said various witnesses had proposed amendments to weaken the bills. In contrast, he pointed out that his bill, H.R. 6387, offered stronger protection to the public.

He said:

"It gives this Administrator the power to fix rates subject to the approval of the Federal Power Commission, which should, in my opinion, be solely regulatory in its relation to Bonneville."

This quotation was notable in that he favored the rates being subject to FPC approval, confining the FPC to a regulatory role, and leaving the Administrator the power to fix rates.

Pierce asked:

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GENERAL SERVICES ADMINISTRATION

"Who is to fix the rates, the Administrator or the Federal Power Commission? My belief is that the rates must be initiated by the man on the job who is charged with the responsibility of marketing power. This man is the Administrator. He and his staff will be entirely familiar with the whole situation and devote their entire time to its study. Those rates, before becoming effective, should be approved by the Federal Power Commission, by law a quasi-judicial and not an administrative authority. It would seem improper for the Federal Power Commission to have administrative authority over initiation of rates of Bonneville when they are exercising judicial authority over interstate private power companies."

In view of his strong opinions, it is interesting to note his bill actually would have given more authority to the FPC than that finally provided by the Bonneville Project Act. The Pierce bill contained this sentence, "From time to time the Administrator may, and upon the request of the Federal Power Commission shall, prepare and submit revised or modified rate schedules to the Federal Power Commission; and such rate schedules shall become effective as approved by the Federal Power Commission."

Congress did not specify the FPC's exact function in reviewing BPA rates. But an inference can be drawn from what happened concerning cost allocations. H.R. 7642 authorized the Administrator to allocate Bonneville Dam costs among power, irrigation, and navigation, subject to FPC approval. As enacted, the law placed the full responsibility on the FPC.

Thus, it appears Congress wanted the FPC to allocate costs at the dam and determine the power investment BPA should repay. It is understandable that Congress wanted the FPC to be its watchdog because in 1937 cost allocating for multiple-purpose dams was a new and controversial practice. TVA had broken the ice, but Federal agencies did not agree on a common cost allocation method until the early 1950s.

Bonneville Project Act language was virtually repeated in the Fort Peck Act of 1938, with the FPC assigned the responsibility for allocating costs. The same was true for the River and Harbor Act of 1945, with respect to McNary Dam and the four lower Snake River dams.

Although the Flood Control Act of 1944 specified the FPC review wholesale rates for power from Corps of Engineers projects, it did not designate the FPC to allocate costs.

The Special Committee to Study Civil Works of the

COMPTROLLER GENERAL OF THE UNITED STATES

U S DEPARTMENT OF THE INTERIOR
March 3, 1849

House Committee on Public Works held a notable hearing May 2, 1952 on the FPC's "primary responsibilities and its activities in connection with Federal programs for the development and utilization of water resources."

FPC Chairman Thomas C. Buchanan and members of the FPC staff pointed out that Congress had not been consistent in giving the FPC authority over cost allocations and review of proposed electric rates at Federal hydroelectric projects. Buchanan quoted from the FPC's May 10, 1937 letter, adding that the Bonneville Project Act limited the FPC's rate review authority to veto power. The 68-page hearing transcript represents an in-depth review of the FPC's difficult position. Congress ignored the FPC effort to gain more authority over BPA rates.

The only indication of the FPC's role that Congress provided from 1937 to 1952 was the omission of any mention in the Flood Control Act of 1944 as to who would have responsibility for allocating costs.

The FPC provided yeoman service in helping BPA establish its ongoing programs. In 1937 the FPC issued the in-depth rate study ordered by President Roosevelt. FPC Chairman McNinch served on the President's special Committee on National Power Policy which drafted H.R. 4948, the Administration's recommended bill in 1937.

The FPC expedited cost allocation for Bonneville Dam and issued a favorable interim order on February 8, 1938. FPC officials participated in Administrator Ross' series of rate hearings, and the FPC approved the first Bonneville rates June 8, 1938.

The FPC provided a representative to the Bonneville Advisory Board, which met frequently in the first 10 years and often took two days to complete the heavy agenda. Board functions were transferred in 1965 to the Secretary of the Interior by means of Reorganization Plan 4. The original Board had served its purpose.

Ben W. Lewis, Oberlin College economics professor, opened his 1945 article for *The George Washington Law Review Special Issue on Federal Power Commission – Silver Anniversary 1920-1945* on "The Role of the Federal Power Commission Regarding the Power Features of Federal Projects" with:

"An examination of the conglomerate array of functions with which the Congress has endowed the Federal Power Commission in its relation to the power features of federal projects suggests the existence of a very real problem in the theory and administration of regulatory controls; and suggests even more strongly that Congress has not yet hit upon either a satisfactory solution to the problem or an effective method for reaching a solution."

While praising the FPC's performance to 1945, Lewis questioned whether it could serve two masters:

"Its primary job in the field of electric power is to control private interstate electric utilities; its functions toward public power projects are patently extraneous and, although they seem to thrust in the general direction of a coordinated program, they represent, rather clearly, a hit-or-miss series of sporadic after-thoughts on the part of Congress.

* * * *

"It is both bad logic and bad public policy to place either of two agencies which are competing on their records for public acceptance and support in a position to condition or retard the performance of the other."

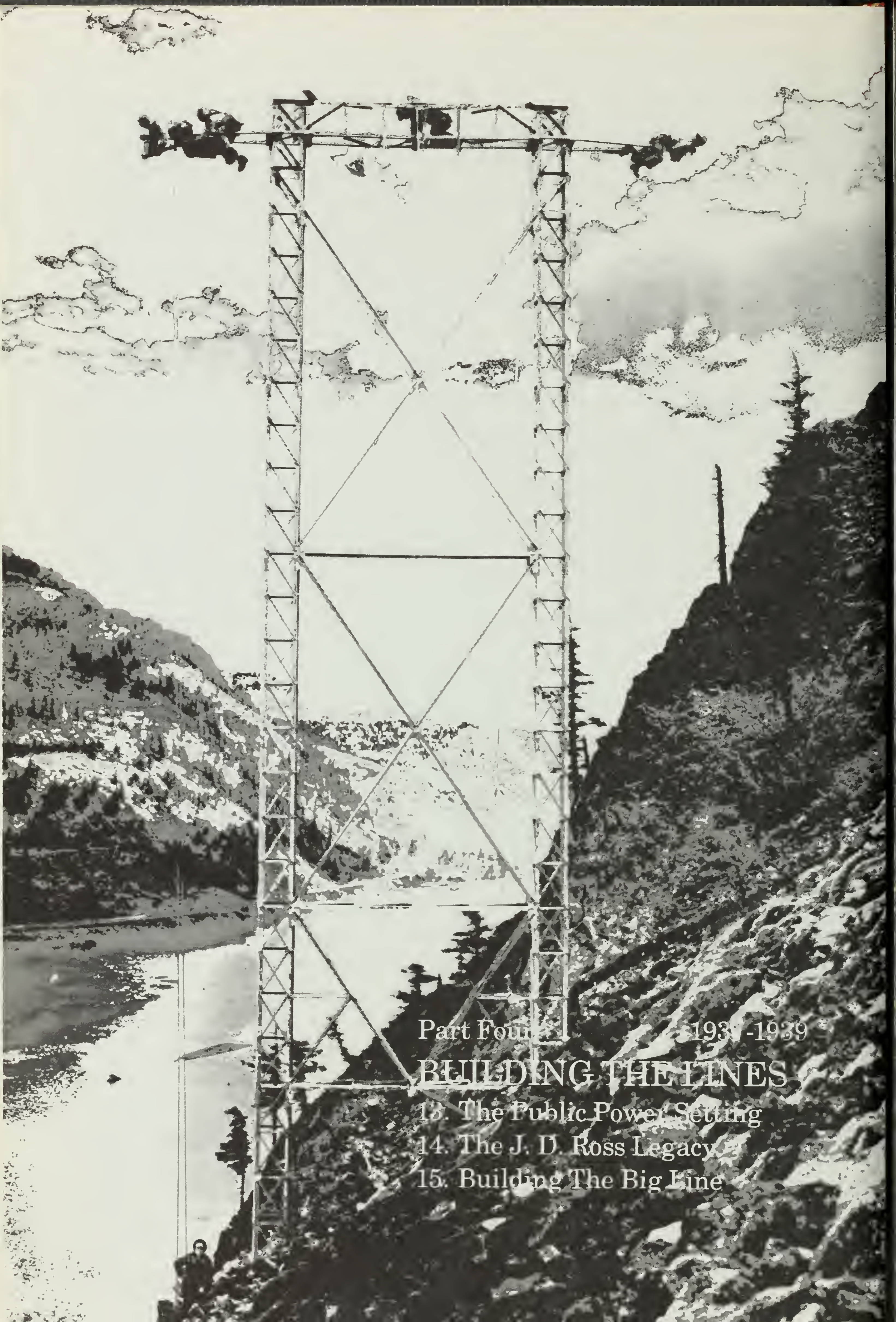
Lewis concluded that the FPC should not regulate the Federal power program and projects:

"The Federal Power Commission has made an outstanding record in recent years in its regulatory activities; it still has substantial contributions to make beyond its routine work – further pioneering in the regulatory field, influencing and raising the level of performance of state commissions, and consolidating the brilliant gains which it has already made. For its own protection, and in the interest of concentrated effort in a field which is peculiarly its own, the Commission itself should advocate the surrender of those of its duties toward public projects which place it in an anomalous position, and which dissipate its energies and its influence."

This advice also went unheeded. In the 1974 Federal Columbia River Transmission System Act the Congress reaffirmed the authority of the Administrator to prepare rates and the FPC to approve them, including rates and charges for wheeling power.

In the new Department of Energy the FPC and BPA are under one administrative roof but with little change in the relationship. The name of the FPC since October 1, 1977 has been Federal Energy Regulatory Commission (FERC).

RURAL ELECTRIFICATION ADMINISTRATION
REA
U.S. DEPARTMENT OF AGRICULTURE



Part Four 193[illegible]-1939

BUILDING THE LINES

13. The Public Power Setting
14. The J. D. Ross Legacy
15. Building The Big Line

13. THE PUBLIC POWER SETTING

There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune;
Omitted, all the voyage of their life
Is bound in shallows and in miseries.
– *Shakespeare: Julius Caesar*

Early colonists used water to power *publicly* owned sawmills and grist mills. Four municipally owned electric plants existed by 1882. Municipalities are the oldest form of consumer-owned electric systems. Historically many began, as rural cooperatives did later, to provide electricity where service was inadequate or nonexistent. The Federal hydroelectric power program evolved incident to construction of dams for navigation, irrigation, and flood control. The conservation movement included a concern that a few public utility holding companies might monopolize control of valuable water power sites. Federal financing of rural electrification since 1935 added a nationwide, politically strong interest in electric power.

BPA's creation provided a focal point for the Federal power program as an effective working partner with electric cooperatives and local public power systems. This partnership gradually expanded to include industrial power purchasers and investor-owned electric utilities.

Seven Pacific Northwest cities operated electric systems by 1900: McMinnville, Milton-Freewater, and Forest Grove, Oregon, and Tacoma, Centralia, Port Angeles, and Ellensburg, Washington. Soon after the Civil War a series of epidemics with many deaths caused by water-borne disease led most U.S. cities to acquire and operate their own water systems. Municipal ownership of water systems gave many cities experience in managing an essential public utility. Some cities, including Seattle, McMinnville and Eugene began generation of electricity incidental to furnishing water. A total of 44 city-owned electric systems exist in the Pacific Northwest of which BPA serves 33 with wholesale power. Private utilities provide power to seven cities, Tacoma serves two, and PUDs serve two.

Some rural electric cooperatives were organized between 1910 and 1925 in the Burley, Idaho, and Tacoma, Washington, areas. Most of the present cooperatives came into being after the establishment of the Rural Electrification Administration in 1935. Private utilities bought out and absorbed four cooperatives. BPA serves 56 electric cooperatives.

The formation of some 1,000 rural electric cooperatives in the United States added a strong allied movement to the

This picture of transmission line construction in the Columbia River Gorge suggests the challenge which the new Bonneville Power Administration and its contractors had to face in mountainous country. The test of each summer's work was provided by the winter storms, snow and ice loading, avalanches, and occasionally an earthquake or plane crash.

local public power movement. This occasioned the term "consumer-owned electric systems" which encompasses both electric cooperatives and local public power systems.

Enactment of the PUD initiative ballot measures in Oregon and Washington in November 1930 created a new dimension in public power. In fact, the initiatives created a new public power movement. While the traditional municipal electric system served only a city and adjacent suburbs, the PUD proposed to combine urban and rural areas, usually on a countywide basis. The campaign literature called for county light systems comparable to the successful city light systems, notably those of Seattle and Tacoma. Oregon and Washington Granges provided the grass roots political support and leadership.

The 1930 PUD laws authorized but did not create PUDs (in Washington, public utility district, and in Oregon, peoples' utility district). Washington voters at the county level created 29 PUDs, of which 22 now provide electric service, mainly in central and western Washington. Oregon voters created fewer PUDs, and, due to the more restrictive Oregon PUD law, only four became active. These were Tillamook PUD in 1932, Northern Wasco in 1939, and Clatskanie PUD and Central Lincoln PUD in 1940. Many rural PUDs became REA borrowers.

The bitterly contested Washington election of November 1936 was particularly telling. In addition to establishing 15 of the State's 29 PUDs, voters turned down private utility candidates for PUD boards and rejected a major attempt to weaken the PUD law. It exerted a strong influence on the State of Washington delegation in Congress just at the time that they began the serious and final consideration of what became the Bonneville Project Act of 1937.

Investor-owned electric systems date back to 1888 (Portland General Electric Company), and 1889 (The Washington Water Power Company). Most other larger companies resulted from mergers of several hundred small companies between 1910 and 1916. Nearly all private companies swept up by holding companies were able to resume independent status as the holding companies were ordered by the Securities and Exchange Commission to divest individual operating companies after 1940.

This woman for all seasons had to be versatile, have many talents, patience and endurance, because she lived in the days before electricity. This housewife has a good wood-burning kitchen stove which enables her to cook, bake, heat water, raise bread in the warming oven, and heat her unelectrified iron – all at the same time.

Prior to 1940 at least 80 percent of electric consumers in the region received electricity from investor-owned companies. This declined to about 60 percent due to electrification of previously unserved rural areas, mainly by consumer-owned systems, and acquisition of some investor-owned distribution facilities by consumer-owned

systems, mainly in western Oregon and Washington.

On the national scene, a number of factors fostered a favorable climate for consumer-owned electric systems, beginning in the 1920s. The Federal Water Power Act of 1920 gave a preference to States and their subdivisions with respect to water power licenses. Low electric rates in Switzerland, Sweden, Canada, and particularly Tacoma, Washington were credited to water power and public ownership. The creation of TVA ended the 12-year (1920-1933) controversy over Muscle Shoals. Authorization of Boulder Canyon Dam (later Hoover Dam) in 1928 presaged an era of Federal hydroelectric project construction. Public expectations and hopes were raised.

In the face of electric power becoming a major national issue, the U.S. Senate refused to seat Smith of Illinois and Vare of Pennsylvania after their election in 1926 because they had received large campaign contributions from private utilities. The Federal Trade Commission's 1927 whitewash report on electric power monopolization prompted a bona fide investigation. This led to the 1935 Public Utility Act in two parts – the Public Utility Holding Company Act, and the strengthened Federal Power Act.

The 1930 elections revealed widespread voter unrest on the electric power issue. Josephus Daniels, editor of the Raleigh, North Carolina *News and Observer* commented on the 1930 election, "Tuesday was a cold day for the candidates serving the power companies instead of the people." Congress turned Democratic. Electric power was a major election campaign issue for Roosevelt in 1932.

In addition to the Oregon and Washington PUD laws enacted in 1930, the election that year provided a mandate for electric utility reform in Oregon. Many Republicans provided the leadership in reform efforts.

The Public Utility Act authorized the Federal Power Commission to regulate interstate electric companies. This included prescribing a uniform system of accounts based on original electric utility plant construction costs. Effective January 1, 1937, FPC issued its uniform system of accounts and instructions for companies to "squeeze the water" out of their plant accounts.

The FPC uniform system of accounts required that companies verify the legitimacy of their operating costs. This led to the FPC order of October 4, 1940 for an investigation of how major private electric utilities accounted for expenditures for political purposes between 1935 and 1940 in the Pacific Northwest.

Samuel H. Crosby, FPC trial examiner, issued an 111-page report February 18, 1941, which summarized 5,295 pages of testimony and 282 exhibits. The evidence disclosed the five private utilities in the Pacific Northwest had spent more than $1 million in their efforts against public power, especially PUDs. They used front organizations and other means to conceal political activities.

Their main thrust was to sponsor Initiative 139 in Washington. It was designed to obstruct PUD efforts to obtain financing for future electric distribution systems acquisitions. Washington voters decisively defeated the initiative

Requiring prisoners to wash their own clothes by means of the zinc wash board would undoubtedly be regarded as cruel and unusual punishment in a penal institution, but the zinc washboard was a way of life in America before the coming of rural electrification.

in the November 5, 1940 general election.

The FPC encountered considerable resistance to its investigative efforts. It had to obtain a U.S. District Court order signed by Judge Lloyd Black, whose son Dave later served briefly as a BPA Administrator, to force the Washington State Taxpayers Association to admit it had been a front for funneling private utility funds to the "Let the People Vote League" which had financed the campaign for Initiative No. 139.

The Trial Examiner found the companies had charged much of their expenses for political activities as operating expenditures. This and other findings led the FPC to issue a strong memorandum February 29, 1941 pointing out the disregard of the companies for good accounting practices and violation of the uniform system of accounts.

Commissioner John Scott wrote an even stronger concurring opinion saying the problem went deeper than accounting procedures:

"I concur in the action and general conclusion of the Commission. In addition thereto, however, my examination of the record developed in this investigation impels me to discuss further a situation which, in my opinion, strikes at the very roots of our democratic form of government.

* * * *

"The activities of these companies, disclosed by the record, show no willingness to permit the sovereign citizenship of the areas in which they operate to maintain by normal democratic processes the choice of the means of providing for themselves essential utility services. Through the expenditures and subversive activities of these companies the strength gained from nursing at the public breast was used to strike at the very heart of the continuance of free elections by free people in the determination of great public issues. The record discloses that by subterfuge these companies sought to pollute the political process of free choice at public elections. Funds obtained from the consuming public have been lavishly expended to prevent the people from obtaining electric energy through publicly or cooperatively controlled organizations. The companies arrogated to themselves the right to defeat, if possible, the choice by the people of using other instrumentalities than company owned facilities to supply their requirements for electric energy.

"With respect to such multi-purpose, public projects as those at Bonneville Dam and Grand Coulee Dam, the Record discloses that the companies have continued to resist their development and utilization by the public, long after the will of the people has been expressed through their duly elected representatives in Congress. With other so-called private utility interests these companies have engaged in activities constituting economic warfare against such public instrumentalities created by the people through the duly and regularly conducted democratic processes of the ballot and election.

"If activities such as the record discloses, defying the will of the public, are permitted to continue, the people may be prevented from obtaining the full benefits of cheap electric energy made available to them by the Bonneville and Grand Coulee Dams.

"The public has invested millions of dollars in these great projects, not for the purpose of increasing the profits of the private utilities, but to provide cheap electric energy for consumers generally. Not only is this public purpose threatened by the utilities' activities, but the great public investment itself is endangered. To make accounting entries or adjustments in the books of the utility companies is no solution of the basic problem posed by the record in this matter. The important thing is the adequate protection of the inherent right of the people to make economic and social progress and to permit them to utilize and enjoy a great natural resource.

"To accomplish these ends Congress may wish to notice the facts disclosed by this record and consider the necessity for appropriate action to protect the public investment and principles involved."

As a result of this and other extensive investigations, the FPC by October 31, 1947 had ordered that utility plant accounts be reduced by $1.3 billion. Exposure of utility accounting practices adversely affected the public image of utilities. In the long run the accounting regulations helped the utilities. They developed more conservative balance sheets and enjoyed a stronger basis for issuing stocks and bonds.

The public power sentiment for establishment of new PUDs peaked in 1936 and 1938 and had run its course by 1940. Acquisitions by the PUDs of private systems occurred mainly 1939-1949, and the Seattle acquisition in 1951. Cooperatives grew almost wholly through service to unelectrified areas, mainly from 1945 to about 1960. The equilibrium between investor-owned and consumer-owned systems has changed little since 1961, giving the region its present pluralistic complexion and a general reconciliation to a live-and-let-live cooperative climate since about 1962.

The coincidence of Franklin D. Roosevelt's landslide reelection in November 1936 and the public power sentiment peaking in the same election, particularly in the State of Washington, set the stage for enacting the Bonneville Act and for the selection of a public power man as first Administrator.

From 1933 through 1937 President Franklin D. Roosevelt provided the focal point and leadership for policy on Columbia River development and writing the Bonneville Project Act. His personal, friendly, and protective interest would continue for eight more years, but now the focal point would shift to the Administrator.

Luck, good timing, and fortuitous circumstances often determine the direction and success of a policy or program. The region's good luck in having the Columbia River as an outstanding water power potential, the readiness of the Army's 1932 plan of development, the urgent need for jobs to overcome the depression, and the unusual interest of President Roosevelt had much to do with the launching of the program. For many years Roosevelt had been frustrated in his efforts to obtain water power development at Niagara Falls and on the St. Lawrence River, and that development did not come until long after his death. Perhaps he saw in 1933 an opportunity to do on the Tennessee and Columbia Rivers what he could not accomplish in the State of New York.

The genius of management and political judgment may often lie in recognizing the circumstances and changing situations as opportunities for initiating new public policies and programs, and striking while the iron is hot.

The Bonneville Project Act placed in the hands of the Secretary of the Interior the authority to select and appoint the Administrator, but in fact President Roosevelt had made the selection perhaps as early as April 1937. Appointment of his friend J. D. Ross would enable Roosevelt to feel that the enterprise was in good hands. Ross reported personally to the President. Another peculiarity of the arrangement was the half-time nature of the appointment, as Ross also served as Superintendent of Lighting for Seattle City Light.

The strong assertion of public power sentiment in the Pacific Northwest at the November 1936 election provided an unusual historical setting and political climate both for enactment of the Bonneville Act and for the selection of J. D. Ross as the first Administrator. In this position, for a time all too brief, he launched the fledgling Bonneville Project and initiated construction of the transmission grid system.

James Delmage Ross

14. THE J. D. ROSS LEGACY

It is fitting that every American should know of the passing of one of the greatest Americans of our generation. Mr. J. D. Ross, fighting against illness, built for himself a strong body and a brilliant mind in the building of Alaska and later of the Pacific Northwest. An outstanding mathematician and an equally great engineer, he combined with this the practical ability to make things work in the sphere of public opinion and successful business. More than that, he was a philosopher and a lover and student of trees and flowers.

His successful career and especially his long service in behalf of the public interest are worthy of study by every American boy.

My personal affection for him grew with the years and because so many people leaned on him for so much of inspiration and advice, his place in our country will be almost impossible to fill.

–Franklin D. Roosevelt
Tribute to J. D. Ross
March 15, 1939

The historical setting changed abruptly in 1937 to 1939 due to a series of unfavorable factors during the 16½ months J. D. Ross was Administrator, Bonneville Project. Yet he accomplished much.

The economy turned sharply downward in late 1937 and remained adverse until the defense and war boom began in 1940. War clouds gathered on the horizon. The New Deal lost ground in the 1938 election. The Pacific Northwest entered a period of controversy and turmoil, and the public looked to the Federal Government for help in establishing public power institutions. Optimism makes opportunities of such adversity. Ross had the optimism.

He served vigorously as the instrument of change. He was able to facilitate change because he had wide support among the people of the Pacific Northwest. He also had the confidence and support of the President.

A Purposeful Life. J. D. Ross had lived a purposeful life, capped by his launching the master plan for the Bonneville transmission system. Born in Chatham, Ontario, November 9, 1871, he completed 2 years college, taught school 6 years, and joined the gold rush to the Yukon. Largely a self-taught electrical engineer, he tried his hand as an electrical contractor at Anacortes, Washington, before moving to Seattle.

The people of Seattle voted 3 to 1 on March 4, 1902 for a $590,000 bond issue to install two 1,200 kilowatt hydroelectric generators in connection with the municipal water supply from Cedar Falls. Seattle hired Ross as an electrical engineer January 2, 1903.

The electric plant began serving its first customer in April 1905. While the private company serving Seattle had a prevailing rate of 20 cents per kilowatthour for the initial block, Seattle's initial rate was 8½ cents per kilowatthour, available on a postage stamp basis throughout the city. By 1911 the private utility matched the city rate, so July 1, 1911 the city announced a residential rate of 7 cents/kWh for the first 60 kWh and 4 cents/kWh for anything exceeding that. The company met the rate in November 1911. The Stone and Webster interests merged several small companies to form the Puget Sound Power and Light Company (PSP&L) in 1912.

The rate battle continued. The city cut its rate July 1, 1912 to 60 kWh at 6 cents/kWh and 4 cents/kWh for anything beyond that. PSP&L matched it a month later. On April 1, 1915 the city residential rate dropped to 45 kWh at 5½ cents/kWh and 2 cents/kWh beyond that. Again the company met the rate, but only in the competitive area.

Meanwhile, against strong newspaper opposition, voters approved bond issues in 1904, 1906, and 1908 to expand the Seattle electric plant. They voted April 1, 1910 to amend the charter to establish the separate Department of Lighting, however, Mayor Hiram C. Gill appointed a private power company man as lighting superintendent. A year later the voters recalled Gill on charges he was running a wide open town.

New Mayor George W. Dilling appointed Ross lighting superintendent in March 1911. Ross almost came to grief in 1914 when a replacement dam was built at Cedar Falls without an adequate preconstruction soil condition survey, and it failed to hold water. This forced the city to build a 7,500-kW oil-fired, steam electric generating plant at Lake Union, which is still available for emergency use.

Meanwhile Ross had been studying all available hydroelectric sites west of the Cascade Mountains within 150 miles of Seattle. He found PSP&L had obtained U.S. Forest Service permits for many sites but was not meeting development requirements.

When a PSP&L permit for the Skagit River lapsed, he seized the opportunity to personally file for the site July 17, 1917, and file formally for the city August 7. Despite protests from PSP&L, Secretary of Agriculture David P. Houston awarded the Skagit permit to the city December 24, 1918. It was a great Christmas present for Seattle. Ross began building.

President Coolidge pressed a button September 24, 1924 to energize the Gorge plant as the farthest downstream unit of the Skagit development. The Diablo plant went on line August 26, 1930.

Progress stopped when Frank Edwards became Seattle mayor in 1929. He stymied proposed plant expansion and a bond issue to buy out PSP&L. He turned down the Department of Lighting's request to do its own engineering. That issue went the initiative route to a vote by the people March 10, 1931. The day before the vote Mayor Edwards fired Ross.

Ross promptly went on radio to urge voters to adopt the initiative. It carried by 17,000 votes. For a change, the newspapers supported Ross and condemned Edwards. After failing to get the city council to impeach Edwards, within a week after the vote Friends of City Light began circulating petitions for his recall.

Meanwhile, New York Governor Franklin D. Roosevelt signed a law April 27, 1931 creating the New York State Power Authority, and invited Ross to be a consulting engineer on the Saint Lawrence River project. Ross accepted. While in New York that June he met Morris Llewellyn Cooke, Leland Olds, James Bonbright, Frank Walsh, and others on Roosevelt's power team.

Seattle voters recalled Edwards on July 31 with a vote of 35,657 to 21,836. The next day Mayor Harlin reappointed Ross lighting superintendent. The Seattle *Post-Intelligencer* published a huge picture of Ross with the caption "Vindicated By People." Publisher of the Seattle P.I. was John Boettiger, son-in-law of President Roosevelt.

It is related that when he was fired by Edwards, Ross told Department of Lighting secretaries, "You girls look dejected and as you like rhymes, here's a little one for you:

"Be not dismayed, these severe afflictions
Not from the ground arise.

But oftentimes celestial benedictions
Assume this dark disguise."

Governor Roosevelt sent congratulations to Ross on his reappointment. Ross sent Roosevelt his newly published book, *New Views of Space, Matter and Time*. In an August 1931 letter, Roosevelt commended Ross on his book and his ability to combine theory and practice. They exchanged seven letters in 1931 and 1932, generally on electric power and Roosevelt's presidential campaign. Although a Republican, Ross strongly supported Roosevelt. Ross also often visited at the home of John and Anna Roosevelt Boettiger. Ross continued as Seattle's lighting superintendent from 1931 to his death, but often was on leave of absence or serving part time. He served part time on both jobs while BPA Administrator. He was a consultant to the FPC on the

National Power Survey in 1934. He became an advisory engineer on power to the Public Works Administration (PWA) in 1935. He suffered frustration as a commissioner of the Securities and Exchange Commission from September 1935 to October 31, 1937 because the Public Utility Holding Company Act was tied up in the courts. By late 1937 Ross was anxious to return to the Pacific Northwest as first Administrator, Bonneville Project, with headquarters in Portland, Oregon.

What did Ross bring to BPA? People knew him as the father of Seattle City Light, a leader in the public power struggle, an expert on electric power, a prolific writer and speaker, and personal friend of President Roosevelt. He had extensive radio interview experience. He had survived more than 30 years of competition and philosophical attacks from PSP&L.

In Seattle, the inhouse, grass roots organization Friends of City Light helped on publicity and political campaigns. He had a loyal staff, that he had personally trained.

At the Bonneville Project on November 1, 1937, he was the only employee. With only $100,000 available for the remaining 8 months of the 1937-1938 fiscal year, Ross had to limit his hiring. From Seattle he borrowed Robert Beck, engineer; Isaac Comeau, accountant, and George Holmes Moore, rate engineer. Ulric J. Gendron moved from Washington, D.C., to become Executive Assistant. Stephen B. Kahn came from TVA to direct public relations. Engineer Charles E. Carey had been with the PNWRPC. Ross assigned Engineer J. Perry Alvey to head BPA's Washington, D.C. office. Attorney John Fisher became General Counsel and Attorney Doris Rae Keeler Assistant General Counsel. Richard L. Neuberger and Jack R. Cluck were temporary staff assistants. Ivan Bloch joined July 5, 1938.

In line with his belief that the Bonneville Project had a mission to promote establishment of local PUDs, he employed six field engineers in January 1938 for 3 months to survey power requirements, and promote formation and activation of PUDs. Field engineers Morton Tompkins and Byron G. Carney in Oregon, and Neal Jones, Frank F. Fitts, Fred J. Chamberlain, and E. F. Banker in Washington helped the sponsors of new PUDs.

The BPA Bulletins. Administrator Ross believed in communication. The 36 informal, mimeographed news bulletins through June 1939 provide a quick picture of this period.

The February to June 1938 bulletins were a step-by-step account of how he set up the postage stamp rate, as described earlier. Another group of bulletins reported on speeches in which he usually advocated public power and methods for acquiring private utility facilities. He reported on his Washington, D.C. trips, budget requests, the objective resale rate (October 25, 1938), the transmission grid master plan (January 20, 1939), and, as related in the next chapter, construction progress.

First BPA Annual Report. "J. D. Ross – His Book" would be a fitting title for the first annual report of the Bonneville Administrator. The report reflects his power development philosophy, infectious enthusiasm, and penchant for telling a story. The 81-page volume, largely written by BPA staffers Bloch and Alvey, covered the 8 months ending June 30, 1938. Since the Bonneville Project had no power to sell in that period, Ross used the report as a platform to tell the world, and a skeptical Secretary of the Interior, of the opportunities for developing the Pacific Northwest by means of low cost power.

He explained how the desire for a navigable waterway led to building Bonneville Dam and the need for irrigation led to building Grand Coulee Dam. He reported on the FPC cost allocations for Bonneville and the FPC approval of the rate schedules. He recorded the progress in forming new public power institutions in Oregon and Washington. He emphasized the demand for more low cost power for home use, farms, shops, existing industry, and new industries. He closed the section with a forecast of possible additional needs for national defense purposes.

Ross on National Defense. On March 18, 1938, President Roosevelt directed the FPC to cooperate with the War Department in surveying the nation's power facilities. The July 1, 1938 confidential report advised the President of a situation "so serious as to require immediate attention."

In August, Roosevelt asked Ross to investigate the feasibility of linking the nation's power resources. In her history of the Bonneville Power Administration from September 1939 to January 1942, Lillian Davis refers to Ross' report to the President:

"According to Ross, the proposed 'lifeline' would protect America's electric supply by permitting distance transmission of direct current through underground cables. Such a system, he said, would be safer from aerial attack in time of war."

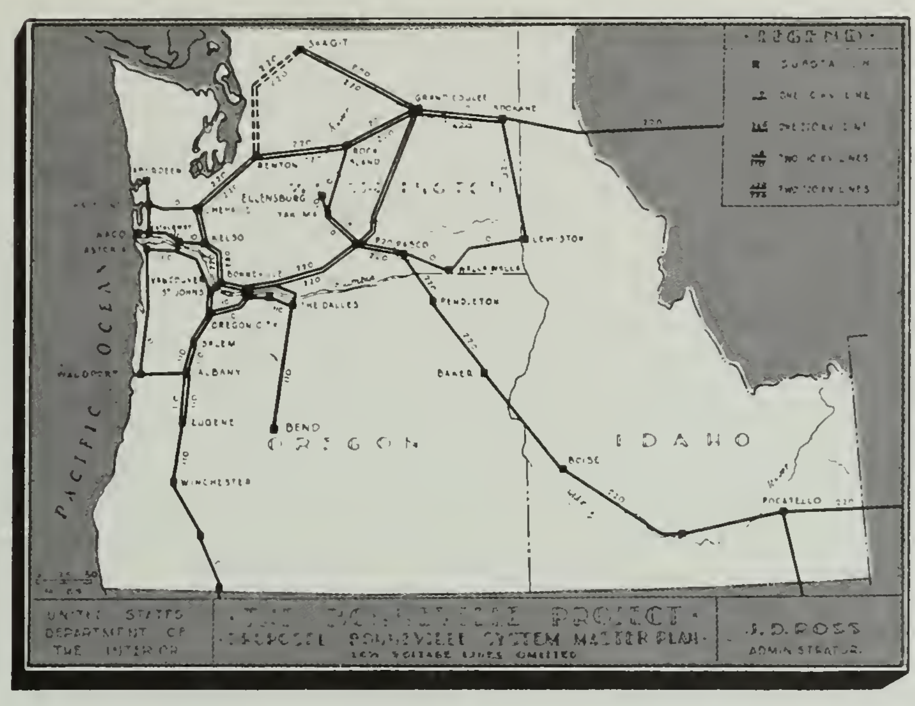
Roosevelt held a conference at the White House on September 1 to establish the National Defense Power Committee (NDPC) with Louis Johnson, Assistant Secretary of War, as chairman. NDPC considered many proposals including the Reconstruction Finance Corporation (RFC) financing new generation for private power companies. On November 3 Ross urged FPC Commissioner Leland Olds to insist that any power facilities financed with government money should be owned by the Government.

In his first annual report as Administrator, completed December 1, 1938 Ross included a 15-page section entitled "Growth of Consumption and of Installed Capacity." In it, he used national defense production needs as the basis for urging early installation of all generators at Bonneville Dam:

> "It is logical to expect these industries to make increasing demands upon the installed capacity of the Pacific Northwest. Bonneville's output will therefore stand as a safeguard against acute power shortage.
>
> "The existence of all these circumstances makes it inevitable that the growth in consumption will outstrip installed capacity. As a result, the Bonneville installation of 10 units, with a total generating capacity of 504,000 kilowatts, will barely meet the urgent need for power.
>
> "Shortly before the end of the World War the country was gripped by a most serious power shortage. The generators of the Nation were taxed to their utmost capacity. Power for a time was the 'bottle neck' that threatened the necessary expansion of industrial production. Manufacture of sorely needed materials was threatened by the grave power shortage. This Nation wants peace and it must be prepared to maintain it. Modern warfare is fought in the factory as much as in the air or trenches. America must be ready to meet not only peacetime needs of power for home, farm, and industry, but must be assured of her ability to cope with emergency demands for large blocks of electricity. In the hydroelectric streams of the Pacific Northwest is potential power far in excess of that available in other regions of the Nation. It should be developed at an economic rate to meet mounting peacetime needs and the equally important possibilities of emergency drains.
>
> "Preparedness requires foresight."

The Master Plan. In another 10-page section Ross unfolded the 220,000 volt transmission grid "master plan." It was based on a central triangle with a double-circuit between Bonneville and Grand Coulee Dams, augmented by backbone lines to Spokane, Seattle, and Portland, south through Oregon to California, southeast into Idaho, and east through Spokane to Montana. It approximated the PNWRPC plan of November 1, 1935, which was also drawn by Charles E. Carey.

Charles E. Carey's 1935 plan for a Pacific Northwest transmission grid was adopted by J. D. Ross as the master plan. In 1962 BPA dedicated the Charles E. Carey Testing Station to him as "Engineer extraordinary, man of vision."



Ross built up the construction organization, initiated the surveys, right-of-way clearing and ordered the materials, as discussed in the next chapter. Then his time ran out.

J. D. Ross As We Knew Him. The unexpected, sudden death of Ross on March 14, 1939 at age 67, due to a blood clot, brought an avalanche of tributes approaching adulation.

The special March 1939 46-page edition of *The Bonneville Spark,* the employes' monthly bulletin, reproduced many of the tributes and newspaper editorials under the caption "J. D. Ross As We Knew Him." The last item was a reprint of the article "J. D.'s Dream" that he wrote for the October 11, 1937 Portland *Oregonian.* It emphasized his goal for Bonneville: to provide the greatest good to the greatest number.

Boettiger's eulogy expresses the legacy Ross bequeathed:

"If you have sailed on the Alice Ross on the man-made lake above Diablo Dam, and have suddenly heard over the lap of the waves, seemingly coming from nowhere, the soft strains of 'Beautiful Isle of Somewhere,' you will appreciate one trait of that great man who has just left us, J. D. Ross.

"If you have seen the bewitching gardens, a veritable tropical paradise, which have been nurtured by his hands at the dam site, and which have filled thousands of visitors with wonderment, you have come into contact with still another facet of J. D. Ross.

"If you have beheld the dam itself, and the great house of turbines which feed power into the maw of our metropolis, you have sensed the mechanical genius of J. D. Ross.

"If you have read of his plans to transmit the power of harnessed rivers over this whole land of ours; if you have heard of his learned discussion of Einstein's theory of relativity; if you know of his researches in the chemist's laboratory, then you comprehend a bit of his renown as a scientist.

"But if you have not sat in the presence of J. D. Ross, if you have not learned from his lips his love of his fellow man, if you have not witnessed his gentle, persuasive way with a child, then you have forever missed that part of J. D. Ross which was his strength and his comfort and his real greatness.

"What a pity it is that 'J. D.' had to turn the last page of life at the very time that his greatest dream was being realized.

"He sought above all else to transmit the blessings of natural power into the service of mankind. He had found joy in the building of Bonneville and Coulee Dams on the Columbia, and he grasped with utmost eagerness the task given him by President Roosevelt to perfect the grid system by which the power of those projects will be delivered at low cost to homes and farms and factories over this whole Pacific Northwest.

* * * *

"The work will go on, and the imprint of the genius of 'J. D.' will be on it. Let those who carry on for him be inspired by the honesty of his purpose, and make full use of the heritage of wisdom he has bestowed.

* * * *

"Seattle has lost a loyal son who gave without stint and asked naught. The President has lost one of his most valued and trusted aids.

"And the 'Beautiful Isle of Somewhere' has gained a dauntless spirit."

Ross remains a part of the BPA spirit and tradition. The dedication of BPA officials and employees derives in part from the philosophy he taught and the motivation of public service he practiced. He established the BPA tradition of serving the people of the Pacific Northwest.

15. BUILDING THE BIG LINE

I believe that the Government owning these plants should build a proper system of transmission lines and also own and operate them, then sell wholesale to districts, to cities, and companies...

–J. D. Ross

Thus, Ross, then a member of the Securities and Exchange Commission, opened his testimony May 9, 1936 before the Senate Committee on Agriculture and Forestry hearing on marketing Bonneville power. Would power from the two dams be sold by two separate agencies in competition? Would the dams even be interconnected? The issues in 1936 were very much in doubt. Just prior to the hearings the PNWRPC December 1935 report became available in book form. It featured a large, foldout map of a "Proposed Super-Power System" for the Columbia River Basin. The map later basically became Ross' master plan for the BPA transmission grid.

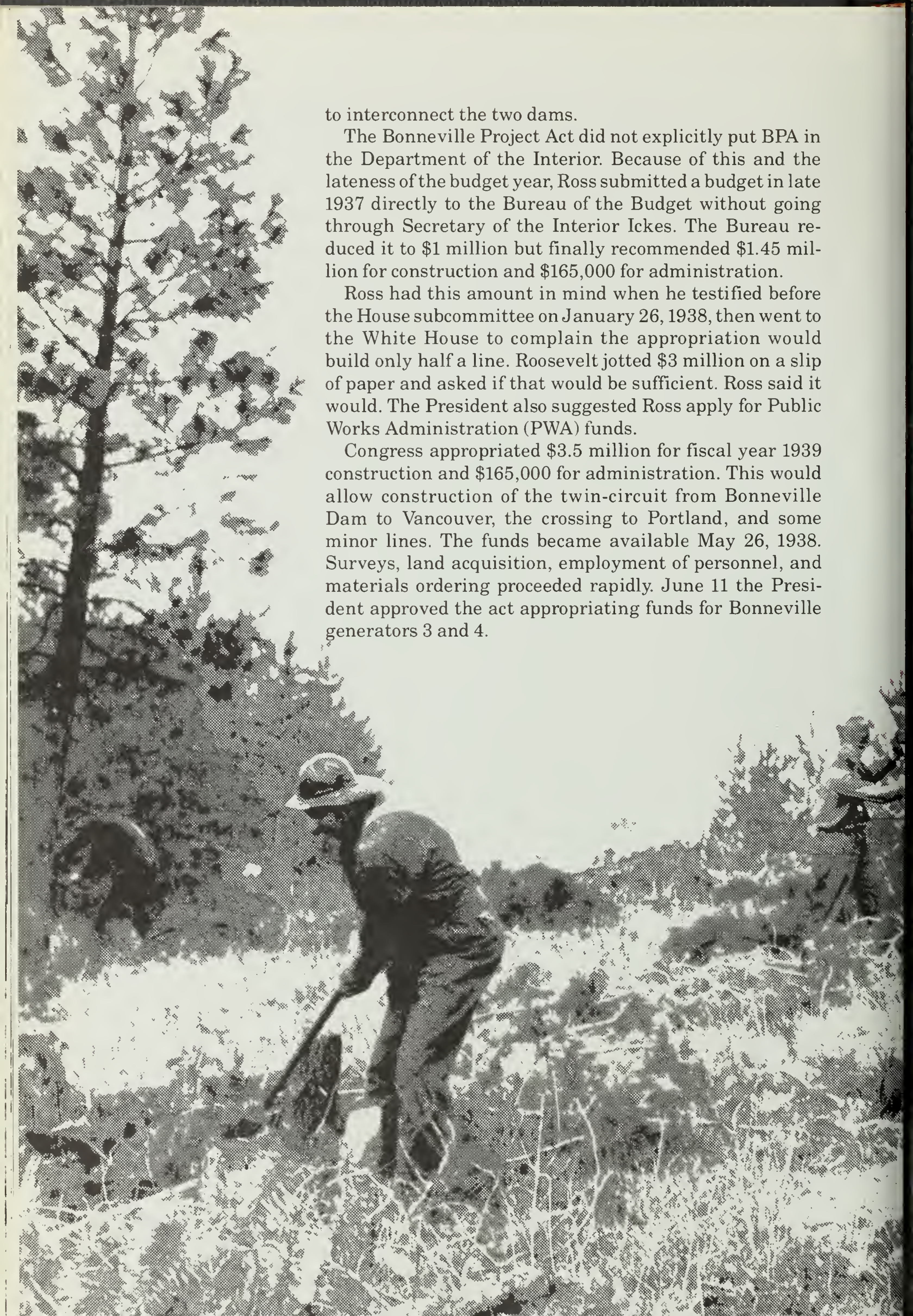
Nothing much happened after the Senate hearing. Congress adjourned.

In *Our Promised Land,* Neuberger recalls that early in 1937 President Roosevelt showed Ross the bill, drafted by the Committee on National Power Policy, which would become the Bonneville Project Act. Ross said, "All the responsibility is placed in one man. He can't pass the buck to anyone else." Roosevelt replied, "And you are that man." This anecdote explains a letter Ross sent April 27 from Washington, D.C., to Robert Beck at Seattle City Light:

"I was with the President about an hour and a half today and he assured me of the tie line and his help to put it in the budget for next spring. The plant will be running then and we can now study the specifications & plans. If I could get you on some of that work would you like to go? . . . This whole letter is confidential. I never quote the President."

This reveals Ross's expectation of becoming the Administrator, the start of his thinking toward recruiting top staff, and his preoccupation with a quick start on constructing the strategic transmission interconnection between Bonneville and Grand Coulee Dams. Ross recognized this intertie as the critical line of the grid system, the jugular vein, possibly more so than he knew. When Roosevelt dedicated Bonneville Dam September 28, 1937, he emphasized the goal of regionwide benefits.

Ross directed his six survey crews to locate rights-of-way for the two transmission lines to the Portland-Vancouver area. They would prompt power sales, and bring in revenue that Ross felt was needed. He also initiated the big line



to interconnect the two dams.

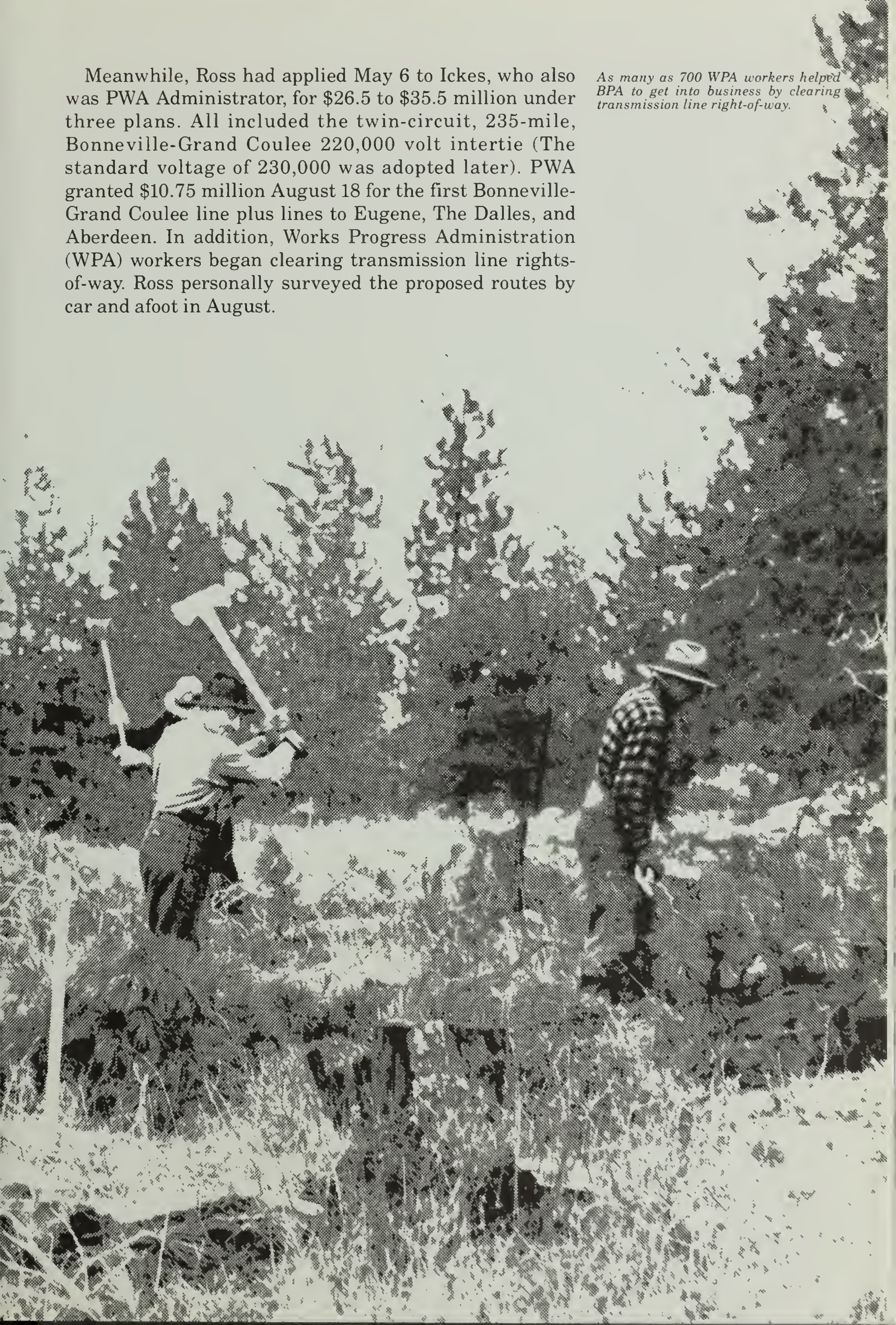
The Bonneville Project Act did not explicitly put BPA in the Department of the Interior. Because of this and the lateness of the budget year, Ross submitted a budget in late 1937 directly to the Bureau of the Budget without going through Secretary of the Interior Ickes. The Bureau reduced it to $1 million but finally recommended $1.45 million for construction and $165,000 for administration.

Ross had this amount in mind when he testified before the House subcommittee on January 26, 1938, then went to the White House to complain the appropriation would build only half a line. Roosevelt jotted $3 million on a slip of paper and asked if that would be sufficient. Ross said it would. The President also suggested Ross apply for Public Works Administration (PWA) funds.

Congress appropriated $3.5 million for fiscal year 1939 construction and $165,000 for administration. This would allow construction of the twin-circuit from Bonneville Dam to Vancouver, the crossing to Portland, and some minor lines. The funds became available May 26, 1938. Surveys, land acquisition, employment of personnel, and materials ordering proceeded rapidly. June 11 the President approved the act appropriating funds for Bonneville generators 3 and 4.

Meanwhile, Ross had applied May 6 to Ickes, who also was PWA Administrator, for $26.5 to $35.5 million under three plans. All included the twin-circuit, 235-mile, Bonneville-Grand Coulee 220,000 volt intertie (The standard voltage of 230,000 was adopted later). PWA granted $10.75 million August 18 for the first Bonneville-Grand Coulee line plus lines to Eugene, The Dalles, and Aberdeen. In addition, Works Progress Administration (WPA) workers began clearing transmission line rights-of-way. Ross personally surveyed the proposed routes by car and afoot in August.

As many as 700 WPA workers helped BPA to get into business by clearing transmission line right-of-way.



One incident illustrates the ingenuity of the survey crews: one tangent of the Bonneville-Grand Coulee line was sighted in at night using the lights of an automobile 72.33 miles away.

Some suggest the confusion of PWA and WPA was planned. Public Works Administration set up in 1933 under Ickes handled large projects. The Works Progress Administration was set up in 1935 under Harry Hopkins to put men to work quickly. The President used both to help get BPA construction started.

Bonneville Advisory Board. The Bonneville Project Act provided that the Administrator consult with the Bonneville Advisory Board which was comprised of representatives of the FPC and Secretaries of War, Agriculture, and Interior. At the first meeting November 30, 1937 discussion concerned proposed allocation of Bonneville Dam costs, wholesale rates, additional generators, and transmission.

Those at the second meeting April 18, 1938, agreed on proposed rate schedules and reviewed transmission progress. There were no other meetings that year, but on October 18, Ross briefed newly appointed board members from FPC and Agriculture on the board's progress. He mentioned a long list of items, including the fact that there were 700 employees on the Bonneville Project staff, surveys had been completed for 600 miles of lines, 550 WPA workers were clearing transmission line rights-of-way, contracts had been let for $4 million in materials, and power sales arrangements were proceeding.

J. Perry Alvey advised Ross on December 3 that General Schley, Corps of Engineers chief, had mentioned to the Appropriations Committee that the Bonneville Project Act stated the Administrator would act in consultation with the Bonneville Advisory Board. Ross promptly cleared up the matter through General Robins at Portland, and dispatched a letter December 6 to bring board members up to date. The 1937-46 Board minutes constitute a running account of policies considered, and progress reports.

Transmission Line Progress. Constructing long-distance, high-voltage, high-capacity transmission lines is a challenge to a well-established organization, let alone a new one. In 1938 BPA faced the problem of recruiting engineers, construction workers, procurement staff, land appraisers, attorneys, surveyors, and others to establish a construction organization.

Land acquisition involved obtaining fee simple title to thousands of parcels of land, much of it heavily forested, for

As the westerly winds are lifted by the Cascade Mountains into the higher and colder air, thunder and lightning results. BPA's response to the severe lightning problems was to develop the fast reclosers.

300- or 375-foot width rights-of-way for twin-circuits, using separate, parallel sets of steel towers. Later construction would involve taller and heavier double-circuit steel towers to hold both circuits on a narrower right-of-way, particularly through mountain passes.

Construction roads, material dumps, and large substations were part of the complex construction program. Housing had to be provided occasionally at remote substations or switching centers. Initially, land condemnation required the Department of Justice to process the many law suits. An August 30, 1938 policy change to acquire easements instead of fee simple titles reduced the workload.

Staff members recruited in 1938 included many key persons whose careers extended over much of BPA's history: Sherwood Jones was chief of the land division with A. B. MacPherson assisting; Charles E. Carey, formerly with PNWRPC became principal construction engineer; Donald S. Campbell, civil engineer in charge of surveys; Orin A. Demuth, F.A. Riebe and J. P. Jolliffe, electrical studies; A. A. Osipovich, mechanical; Glen Dunbar, H. R. Stevens and Clarence Frenke, substations; Dean Wright, drafting; C. A. Lund, materials and specifications; C. H. Bjorquist, materials and inspections; Logan C. Stewart, procurement officer; L. M. Applegate and Harold M. Potts, rate studies; and Frank Keenan and Charles Leavy (later Administrator, Southeastern Power Administration), attorneys. R. F. Stevens took over the engineering and construction division when Carey became Acting Administrator following Ross's death.

Procurement involved preparing specifications, bid calls, materials inspection, storage and issuance to the construction contractor. Bids came in on more than $3 million worth of materials from August 10 to October 4, 1938.

The first big line from Bonneville to Grand Coulee included the following main procurement contracts:

September 15, 1938	137,000 insulator units $108,000
September 19, 1938	1,353 steel towers $914,218
September 20, 1938	3,288,000 feet conductor $781,705

Communications was accomplished by carrier current on the transmission line, telephone, and two-way radio. The two-way radio system was used in construction, then in operation and maintenance, and for emergency and civil defense backup during World War II.

With the close of 1938 BPA prepared the budget for fiscal year 1940. It totaled $19.7 million for construction and $400,000 for operations. The Bureau of the Budget recommended $14.4 million. Congress approved this plus $400,000 for operation, maintenance, and administration. Congress also funded Bonneville generators 5 and 6.

BPA moved December 29, 1938 from the old Failing Building in Portland to a new headquarters building at 811 NE Oregon Street. Open house was held there January 10, 1939, and at the Engineering Annex, 1300 NE Union Avenue.

The transmission grid master plan Ross released in December was prepared so individual lines would have the voltage and capacity necessary to serve as part of the long-range network. This involved drafting specifications to take ice and wind loading and lightning conditions into account, as well as electrical characteristics. The first major bid document for the twin-circuits to Vancouver, Washington required 75 pages of specifications. The contract was awarded February 21, 1939, and construction started March 13, the day before Ross died.

The largest BPA installation was built north of Vancouver at Ampere, later renamed J. D. Ross Substation and still later the Ross Complex. Incidental to the major substation, BPA built extensive shop facilities to untank transformers, repair the fleet of vehicles, and manufacture many items. The substation became the center for metering, instrumentation, communications, and specialized equipment, such as that for hauling large transformers. In 1974, the Dittmer Control Center for power dispatching was activated at the Ross Complex.

Two incidents occurred after the death of Ross in connection with The Bonneville Project budget. During House debate on March 15, Representative White of Ohio proposed an amendment to reduce the construction appropriation to $6 million. It was rejected. In Senate hearings March 28 to April 7, the president of one of the private utility companies unsuccessfully opposed appropriations for additional transmission lines. The President signed the Appropriations Act May 10.

Carey was Acting Administrator from February 1, 1939, during Ross's hospitalization, until Frank Banks, chief construction engineer for Grand Coulee Dam, was appointed Acting Administrator on May 4 and took over May 11. Barry Diddle of the Bureau of Reclamation became Assistant Administrator.

Banks made a number of personnel changes. He retained Herbert Marks of TVA as General Counsel and C. Alan Hart as Assistant General Counsel. Horace E. Bixby replaced Beck as head of the project and contract division. R. M. Nance became acting chief of the finance division replacing Isaac Comeau. Other new staff members included Walter Cain, rate engineer; Claude A. Miller, electrical construction, and Ben Creim, principal engineer in charge of construction.

The major event while Banks was in charge occurred June 20, 1939, when the construction contract was let for the first Bonneville-Grand Coulee line. The groundbreaking ceremony was August 7 at Goldendale. The line was considered 48 percent complete by the end of 1939. It was placed in service August 4, 1940, initially at 115,000 volts. The President signed Executive Order 8526 on August 26, 1940, directing BPA to market Grand Coulee Dam power.

The Ross decisions of 1938 to start the first Bonneville-Grand Coulee transmission intertie helped pave the way for BPA to market Grand Coulee Dam power, and subsequently the power from almost all Federal hydroelectric projects to be built in the region. The line became the axis, or base line, for the regional transmission grid, and the commitment to the grid system.

PWA funds, as well as WPA help, made construction of the line possible, and insured its completion several years before it could have been built with regular appropriations. Appropriations might have been difficult to obtain because of the opposition of private utility companies.

Construction of the line was a major challenge. It necessitated the rapid buildup of a strong construction team. Completion of the line demonstrated to Congress BPA's ability to undertake major challenges. In building the big line, J. D. Ross took time by the forelock.

Part Five 1940-1946

SINEWS OF WAR

16. BPA Goes to War
17. Winning the War of Production
18. Electrifying the Rural Northwest
19. Personnel Policy

16. BPA GOES TO WAR

I should like to see this nation geared up to the ability to turn out at least 50,000 planes a year. Furthermore, I believe that this nation should plan at this time a program that would provide us with 50,000 military and naval planes.

–Franklin D. Roosevelt
Message to the Congress Asking
Additional Appropriations for
National Defense.
May 16, 1940

By any standard, World War II constituted a turning point in history, a violent wrenching from the past to a different world, affecting the lives of people and the destinies of nations. It was the first really worldwide war, directly involving 57 nations and their colonies. It introduced new technology and new methods of warfare, including the blitzkrieg, massive bombing by aircraft, the shift of seapower from battleships to aircraft carriers, and the finality of the atomic bomb.

The defeat of the Axis powers was not considered a certainty in the early war years. Germany, Italy, and Japan later made serious strategic mistakes, as historians have pointed out. These errors bought time for the Allies to win the war of production. The Allies won the production war primarily because the United States became an inventive and enormously productive arsenal which remained undamaged and intact while destroying the productive capacity of the Axis nations. The war depended heavily on energy, oil for ships and aircraft, and electricity for production.

The Roosevelt Administration's 1933 emphasis on hydroelectric power development paid off with big dividends for war production in the Pacific Northwest and Tennessee Valley. Rural electrification also paid off in terms of increased farm production.

The 1940-1946 period approximates the historical setting for BPA's war-oriented efforts. The defense buildup had, however, begun somewhat earlier. New war clouds had been accumulating since World War I. The United States did not ignore these warnings entirely, and made some preparations, though little and late.

The perspective on the role of electricity in war production begins with the start of World War I in 1914. As German submarines cut or severely reduced shipments of Chilean nitrates needed for defense production, the Woodrow Wilson Administration sponsored the National Defense Act of 1916. It included authority for the Army Corps

The call to arms became a call for airplanes and aluminum. Soon BPA electric power was helping produce almost half of the Nation's aluminum for the defense effort. Boeing's B-17 was in time displaced by the B-29 or Superfortress, shown in the facing picture.

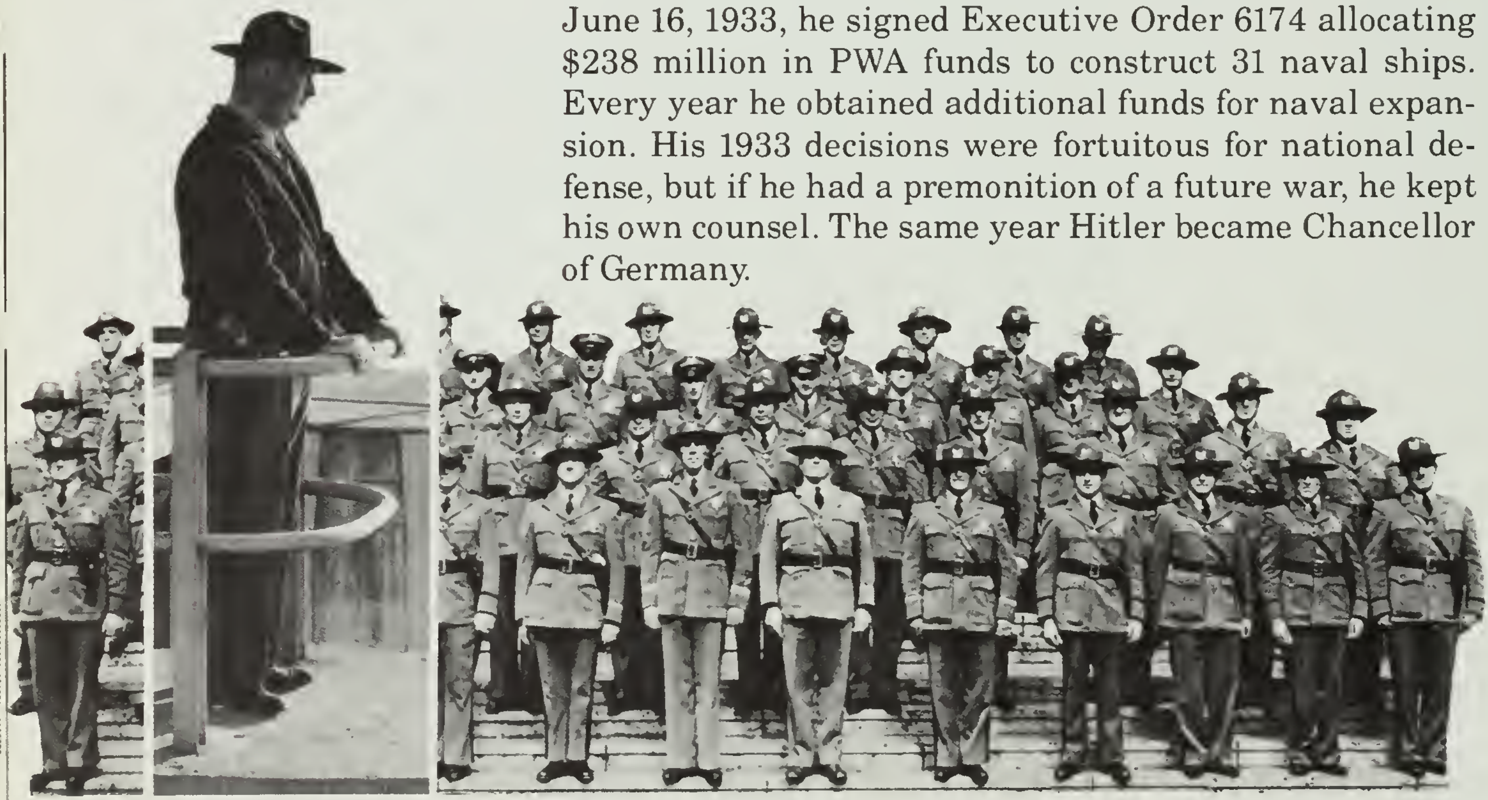
of Engineers to build a dam on the Muscle Shoals reach of the Tennessee River, a nitrate manufacturing plant, and an interim steam electric generating plant. Wilson Dam construction slowed after 1918, and finally was completed in 1925. It became part of TVA in 1933.

The United States and England both were faced with insufficient electric power during World War I. In England this spurred a major investigation and authorization by the Conservative Baldwin government of the British Electricity Grid in 1926. In the United States, military production planners were well aware of the power shortage but the sudden Armistice prevented widespread public knowledge of the problem. Colonel Charles Keller edited the official report, "The Power Situation During the War," published in 1921. Brigadier General William Crozier, Army Chief of Ordinance during World War I, often called attention to the effect of power shortages on the war effort.

Governor Pinchot had in mind wartime power shortages in Pennsylvania when he persuaded the Assembly to establish the Giant Power Survey Board in 1923. This resulted in the Giant Power Report of 1925, proposing a statewide transmission grid system. A flurry of magazine articles on giant power appeared at the same time.

Franklin D. Roosevelt's knowledge of power shortages, gained while he was Assistant Secretary of the Navy during World War I, was apparent during the 1930s. Soon after he became President, he signed the National Industrial Recovery Act which included authority to construct projects such as Bonneville and Grand Coulee Dams. Also on June 16, 1933, he signed Executive Order 6174 allocating $238 million in PWA funds to construct 31 naval ships. Every year he obtained additional funds for naval expansion. His 1933 decisions were fortuitous for national defense, but if he had a premonition of a future war, he kept his own counsel. The same year Hitler became Chancellor of Germany.

BPA had as many as 87 guards on duty at its substations and other facilities as a precaution against sabotage.



The likelihood of war increased yearly. Hitler began rearming in March 1935. Congress passed the Neutrality Act, a setback for Roosevelt. Mussolini seized Ethiopia in October 1935, Hitler reoccupied the Rhineland in March 1936, the Rome-Berlin Axis evolved in October 1936, and the Sino-Japanese War began in July 1937. The Japanese sank the USS Panay in December 1937. Roosevelt spoke of world lawlessness. He asked Congress on January 28, 1938 to authorize a two-ocean Navy, resulting in the Vinson Naval Act. Hitler annexed Austria in March 1938. The notorious Munich Pact of September 29, 1938 for "peace in our time" was another warning.

President Roosevelt began to act to increase the electric power supply March 18, 1938, when he directed the FPC and Army to survey the nation's power capacity. Their July 1 report urged immediate attention to the problem. In August 1938 Roosevelt asked J. D. Ross to study and make recommendations. Ross recommended a national, direct-current, high-voltage transmission grid system, preferably underground. Ross wrote a strong paragraph in the first annual report of the Bonneville Project on the need of power for national defense.

Although Banks moved ahead after Ross' death to construct the Bonneville-Grand Coulee line, he had no enthusiasm for building customer service lines. He pulled the Bonneville Project back from promoting or supporting public power. Secretary Ickes sought as Bank's replacement someone who believed in public power, and would report to the Secretary.

In seeking an Administrator, Ickes, a Bull Moose Republican from Chicago, remembered Dr. Paul J. Raver. Raver was the newly selected Illinois Commerce Commission Chairman. He had written articles on municipal electric systems and had been a public utility economics professor at Northwestern University. When Ickes asked if he believed in public power and received an affirmative answer, he exclaimed, "I don't see how you can and be a professor at Northwestern University!" Raver first turned down the job, then accepted. When Ickes took him to the White House, President Roosevelt said, "Raver, you are stepping into some big shoes," referring to those of the late Ross. At a 20th BPA anniversary dinner in 1958 Raver said, "I always knew from the time of the interview, to the time of his death, that FDR was back of what we were trying to do."

Raver needed all the moral support he could get. He was greeted in his new post as an outsider and carpetbagger. He found the Bonneville Project in what Ickes described as a

Dr. Paul Jerome Raver

"mess." Raver faced the many and continuing challenges of reorganization, conducting studies, building facilities, quadrupling the BPA work force, formulating power marketing policies, and tying BPA firmly to the war effort. As a World War I veteran wounded in action Raver took the threat of war very seriously.

He was with the Bonneville Project, later BPA, from September 15, 1939 to January 14, 1954. The longevity of his term was one of the factors that enabled Raver to make his imprint on the BPA policy and program. He served under three Presidents — Roosevelt, Truman, and Eisenhower — and four Secretaries of the Interior — Ickes, Julius Krug, Oscar Chapman and Douglas McKay.

Most of the 30 Federal hydroelectric projects in the Pacific Northwest were authorized during the Raver era. His was an age of hydro development.

Ross had leaned toward a minimum staff, including a few friends on temporary loan from Seattle City Light whose loyalty remained with Seattle. He organized a construction force of 700 by mid-1939.

Raver recruited a new strong top staff whose primary allegiance would be to BPA. He selected for chief engineer Sol Schultz, who had worked with him on the 1938 investigation of TVA. Raver brought D. Loring Marlett from Chicago, first as technical assistant, then comptroller, and eventually as assistant administrator when Gendron left. Earl Ostrander was chief accountant and later comptroller. Barclay Sickler headed rates and statistics; Dr. William Dittmer, power management, and Warren Marple, rural electrification. Marks was replaced as General Counsel by Hart, then successively C. Girard Davidson, Robert R. Willard, and Norman Stroll. One of Raver's administrative orders in October 1939 established the top staff as the staff advisory council. It was strengthened in 1943 as the executive committee with Roy Bessey as Secretary. Its minutes record policies considered.

Davis' history of BPA (1943) chronicles the enormous challenges and endless details faced by Raver and his staff. A more definitive official record appears in the lengthy BPA annual reports for fiscal years 1939 and 1940. By contrast, the annual reports for 1941, 1942, 1943, and 1944 were brief due to the paper conservation program.

The 1939 and 1940 annual reports each include staff organization charts and an explanation of the evolution of the administrative structure for handling power sales, operation of completed transmission and substation facilities, procurement, accounting, and the myriad details of the construction program. The crash construction program, largely defense-oriented, necessitated increasing the BPA staff to 2,421 by mid-1940, 3,189 by mid-1941 and a peak of more than 4,000 in 1942. Although BPA was then on a 44-hour work week, weekend and night work was common to meet defense plant deadlines. Evolution of the BPA organization from 1937 to 1947 is detailed in Roger L. Conkling's masters' degree thesis. In 1944 Lillian Davis compiled the report, *The Bonneville Power Administration and the War.*

Hitler's blitzkreig of Poland in September 1939 set the stage for a war economy. President Roosevelt declared a limited national emergency September 8, and therewith the Nation entered the 2-year transition to war. This resulted in accelerating the BPA program:

> "The impact of the war on the Bonneville Power Administration has had one preponderant result. It has telescoped more than 10 years of normal growth into a brief 5 years . . . transmission system which has grown from no miles of lines in 1939 to 2,500 circuit miles in 1944 . . . generators which have grown from less than 100,000 kW capacity in 1939 to 1,350,000 kW in 1944." *(The BPA and the War,* 1944)

Raver signed the first contract to supply power to the Aluminum Company of America (ALCOA) for a plant at Vancouver, Washington, December 20, 1939. The initial contract for 32,500 kW soon was increased to 182,500 kW. Many aluminum and other war-oriented industrial contracts followed in the next three years. Industrial loads for war production totaled 899,920 kW and accounted for 92 percent of BPA commitments as of June 30, 1942.

BPA's role evolved against a background of frustration in Washington, D.C. President Roosevelt's National Defense Power Committee, chaired by Assistant Secretary of War Louis Johnson, could not reach agreement with private utilities to increase the power supply. On the advice of Ickes, the frustrated President established the National Power Policy and Defense Committee in October 1939, with Ickes as chairman. Other committee members viewed the shift as an Ickes power grab.

To minimize the bickering, Roosevelt instructed the FPC on June 14, 1940 to prepare a defense power plan. The July 16, 1941 FPC report provided for FPC to have final authority on power and the Reconstruction Finance Corporation (RFC) to finance plant expansion. Now Ickes was stung. He complained the FPC approach would destroy the New Deal power program. When the Japanese struck Pearl Harbor on December 7, Roosevelt adopted the FPC plan. Within 3 weeks the Edison Electric Institute reported a nationwide power shortage. Reviewing the floundering of 1938-1941 Funigiello in his book concluded, "the Nation entered World War II with its power system ill-prepared to meet the demands made upon it."

Meanwhile the events of 1940 had shocked the nation. Hitler invaded Denmark and Norway early that year, entered Holland May 10, Belgium May 16, and took France June 22. The British barely escaped at Dunkirk. Congress agreed to Roosevelt's May 16, 1940 request to increase U.S. production to 50,000 aircraft per year. This required increased aluminum production. The $5 billion Defense Appropriation Act approved in June led to 500 million dollars in defense contracts for Oregon and Washington.

A minor event was the Secretary of the Interior's approval in January 1940 for the Bonneville Project to be renamed Bonneville Power Administration and the Administrator the Bonneville Power Administrator. Together with the August 1940 approval of Grand Coulee power marketing, the new name enabled BPA to prepare for a regionwide role.

BPA's search for identity was not helped by the Portland vote against creating a city-owned electric system in 1940. Spokane also turned down municipal ownership. Raver did note in 1939 and 1940 annual reports the progress of PUD efforts to acquire electric distribution systems, and the successful formation of rural electric cooperatives.

But regional grass roots fervor for public ownership had slowed. The preoccupation with national defense stalemated the public power movement for the duration. BPA adjusted by emphasizing its role in the national defense effort. BPA did continue, however, to build customer service facilities to provide power to new systems that were ready to receive power. Others existed only on paper throughout the war. BPA received less than 10 percent of its revenue in 1945 from public and cooperative systems and three-fourths of that was from Seattle and Tacoma. The War hindered the formation and progress of public power systems and cooperatives.

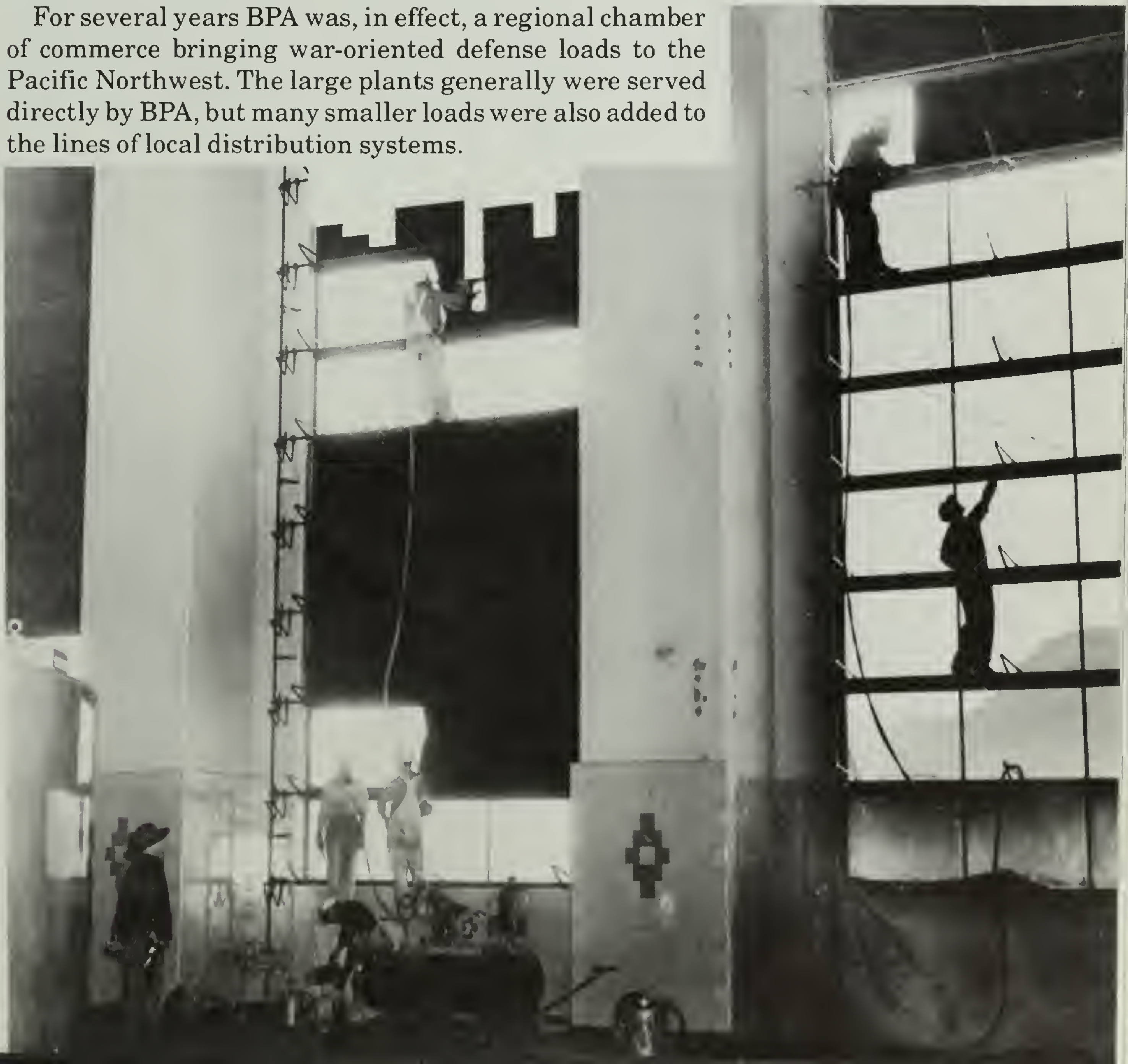
A major event in 1940 was issuance of Executive Order 8526 directing BPA to market the Grand Coulee power output. It enabled BPA to enter into contracts in anticipation of large amounts of prime power from Coulee generators. It also set the stage for BPA to market power from future hydroelectric projects in the region.

There were some legislative efforts to enable BPA to follow the TVA pattern of serving as a broker in acquiring local private electric systems. A joint committee of Congress held hearings on a proposed Columbia Power Administration June 13-19, 1942. The bill did not pass, in part because Ickes opposed a board of directors for BPA.

BPA was able, however, to facilitiate the acquisition of several small private utilities in the lower Columbia River area of Washington and Oregon, and construct transmission lines and substations to serve them. BPA developed customer service policies, standard power sales contracts, wholesale rates, and recommended resale rates. During the prewar and war years BPA aided in formation of rural electric cooperatives, largely on paper, and assisted in distribution system studies so these systems were in position to obtain Rural Electrification Act loans immediately after the war.

BPA's industrial site surveys and county economic surveys of future power needs were especially valuable. Industrial surveys enabled the Defense Plants Corporation to locate new electrometal and electrochemical plants in the region, including the "mystery load" in 1943 on the large Atomic Energy Commission Hanford Reservation, at Richland, Washington.

For several years BPA was, in effect, a regional chamber of commerce bringing war-oriented defense loads to the Pacific Northwest. The large plants generally were served directly by BPA, but many smaller loads were also added to the lines of local distribution systems.



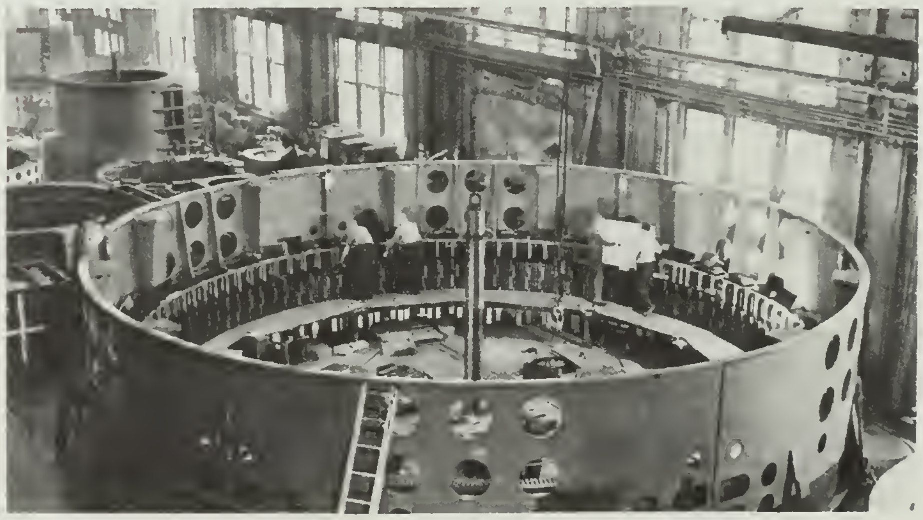
The huge windows at Bonneville Dam are covered as part of the West Coast black out program.

The larger utilities were studied extensively to facilitate interconnections, exchange agreements, and encouragement of regionwide power pooling. The Northwest Power Pool commenced operation August 1, 1942, partly due to the War Production Board's limitations Order L-94 of May 1, but mainly because of BPA studies. Timing was providential; West coast rivers, other than the Columbia, registered the lowest streamflow in 54 years that autumn. Although this placed a heavy burden on BPA, a power shortage was averted.

Meanwhile, BPA had exerted considerable influence toward speeding generator installation schedules at Bonneville and Grand Coulee Dams. The 1939 BPA Annual Report had called for 833,400 kW to be on line by July 1944 for normal peacetime load growth. BPA had issued its first 6-year Advance Program for fiscal years 1942-1947 in the fall of 1940. The 1940 BPA annual report called for all 10 Bonneville generators to be on line July 1944 at 518,000 kW, plus six Coulee units and four more Coulee units by January 1948.

After passage of the Lend Lease Act of March 11, 1941, BPA issued a revised Advance Program in May 1941 and a month later revised it again to respond to war requirements for aluminum and magnesium. Briefly, it required that the 1948 generator schedule be advanced to 1945. As stated in the fourth BPA annual report, "capacity could be made available as fast as generators could be manufactured and installed" (p. 60). A table (p. 65) showed all Bonneville units on line December 1943 plus 15 Coulee units by March 1945 a total of 2,138,400 kW. BPA also urged the start of McNary Dam.

The War Production Board strategy, however, emphasized increasing national productive capacity during 1942, and then devoting material priorities to actual production. This strategy allowed Bonneville Dam to be completed in



Generator installation at Bonneville and Grand Coulee Dams was expedited through 1942; then stopped in favor of allocating materials for direct war production.

December 1943, but only six Coulee units were completed and two additional 75,000 kW generators borrowed from Shasta Dam for an actual total of 1,326,400 kW by 1944.

The BPA transmission system expanded rapidly from 142.3 circuit miles of line on July 1, 1940 to 1,176.8 miles a year later and 2,518 miles by mid-1944. Construction fell off sharply in 1944. The War thus accelerated and then decelerated the generator and transmission program. The seventh Coulee unit finally came on line in October 1947.

Throughout World War II the President and Congress devoted considerable attention to post-war planning and enactment of laws to ease the transition to a peacetime economy. In his State of the Union Address on January 7, 1943, Roosevelt called for victory in war, then victory in peace.

One Pacific Northwest effort in 1943 was the search for storage in Columbia River headwaters to better regulate streamflow for greater downstream power production. It was hoped this could be done with minimum labor and materials. A proposal to raise the level of Flathead Lake was abandoned, after strong local opposition. A major complaint of Montana people was that they had not been consulted. When their advice was asked, they formed a citizen's group which vigorously campaigned for building the Hungry Horse Dam, resulting in the Hungry Horse Project Act of June 5, 1944.

May 22, 1943 the President directed all Federal agencies to prepare plans for postwar public works to take up the anticipated slack in employment when the war ended. BPA's proposal included $26 million worth of war-deferred transmission facilities plus $25 million for new facilities. The paperwork was to be ready for bid calling on demobilization day.

One result of this post-war planning effort was the Flood Control Act of 1944, which adopted the Pick-Sloan plan for developing the Missouri River. The plan represented a compromise between advocates of a Missouri Valley Authority on the one hand and wishes of private utilities on the other. The Act made the preference clause and other key Bonneville Project Act policies applicable to all Corps of Engineers hydroelectric projects nationwide. The companion River and Harbor Act of 1945 authorized McNary, Ice Harbor, Lower Monumental, Little Goose, and Lower Granite Dams. It included a proviso for BPA to market their power output.

Partly as a result of the adverse public reaction to the Flathead Lake proposal, BPA established the Bonneville Regional Advisory Council. Initially it had 20 members who first met March 31, 1944, and next June 5-6, 1944. An assignment for the first meeting was to review BPA's just-published report, "Pacific Northwest Opportunities." It emphasized possible postwar industrial development.

Not to be confused with the Council, the Bonneville Advisory Board created under the Bonneville Project Act operated from 1937 to 1946. It was replaced in 1946 by the Columbia Basin Inter-Agency Committee which met until 1966 and was replaced by the Pacific Northwest River Basins Commission authorized under the Water Resources Planning Act of 1965.

BPA Administrator Raver called 11 meetings of the Bonneville Advisory Board from 1939 to 1946; four of them in 1943. In 1943 and 1944 the Board actively supported upstream storage for increased power production, but that program had to wait for the postwar period. Raver valued and heeded the advice of the Board and other groups.

The war's progress affected BPA. The Stalingrad turning point in late 1942 and early 1943 also marked the shift in emphasis in the United States from building new manufacturing plants to increasing production at existing plants. BPA peak employment of over 4,000 in 1942 dropped to 2,000 in 1943 as the transmission construction program slackened and the draft accelerated.

The Allies went on the offensive in 1944, storming the Normandy beaches in Europe on June 6. The Battle of the Philippine Sea June 19-20 crippled the Japanese navy. Throughout 1944 and most of 1945 Allied Forces captured Japanese islands and recaptured the Philippines, Wake, and Guam. Italy had surrendered in September 1943, Germany surrendered May 7, 1945, and Japan September 2, 1945.

Despite some curtailment in 1943, BPA defense loads had peaked in 1944. Generation for BPA in fiscal year 1944 reached 9.2 Billion kWh, dropped to 9.0 billion in fiscal year 1945, and plummeted to 6.2 billion kWh for the year ending June 30, 1946. BPA's post-war program focused on industrial development. Meanwhile demobilization caused sharp reductions in power loads as aluminum plants curtailed 460,000 kW.

By June 30, 1945 BPA had a system of 2,736.8 circuit miles of transmission lines, and 55 substations. The war had enabled BPA to achieve 10 years of normal peacetime load growth in 5 years. Articles that had criticized building power resources to serve jackrabbits were replaced by those praising BPA's contribution to the war effort. But the praise was short lived, and wartime contributions quickly forgotten. The post-war period would be stormy for BPA.

17. WINNING THE WAR OF PRODUCTION

To American production, without which this war would have been lost.

– Joseph Stalin
Toast at Tehran
Nov. 28-Dec. 1, 1943

Early advocates of Columbia River development had a vision of power for industry. Their reports, testimony to Congress, and speeches in the Congress foresaw industrial development. Portland's Chamber of Commerce wanted new industry and payrolls as the primary reason for building Bonneville Dam. When the National Power Policy Committee drafted the Bonneville Project Act, the lawyers copied much of the language from the TVA Act, including the phrase "...sale to and use by industry shall be a secondary purpose..." Someone from the Pacific Northwest objected. It was deleted on the argument that the Pacific Northwest wanted to welcome industry and not to discourage it.

This chapter focuses on the beginnings of BPA's industrial sales policy from 1937 to 1953, and experience and relationships with large, direct service industries. The industrial sales policy evolved from a background of two changing perspectives. The oldest is England's industrial revolution. The second perspective is the age of electricity. A later chapter will carry forward BPA's relationships with industry through the 1953-1979 period.

The expression "industrial revolution" appeared in the writings of the Frenchman Jerome Adolphe Blanqui in 1837. It did not catch on, however, until popularized by the English sociologist and economist Arnold Toynbee (1852-1883), father of the more famous historian of the same name. The father wrote in 1880 of the industrial revolution to describe England's economic development during the period from 1760 to 1840. The American economic historians Charles and Mary Beard adopted and expanded the concept.

They all emphasized the flood of inventions in textiles, iron and steel, the steam engine, coal as a source of power, the factory system displacing the domestic system of craftsmen and cottage workers, the development of new economic institutions, and a host of social problems. They viewed the industrial revolution more as a process of evolution from an agrarian to an industrial economy. The English writers Oliver Goldsmith (1728-1774) and Charles Dickens (1812-1870) bracketed this period and recorded the wrenching social turmoil, the enclosure movement and its upheaval of rural life, the subjugation of workers, the evils of child labor, and the poverty and drab existence in the congested cities.

Other countries industrialized their economies more recently, the eastern United States following England by about one hundred years. The Pacific Northwest, delayed another one hundred years, experienced a modest shift from agriculture, fishing, forestry, and mining to industrialism in the 1940-1970 period primarily because of the availability of Columbia River power, the demands of World War II, and BPA's early policy of seeking economic development.

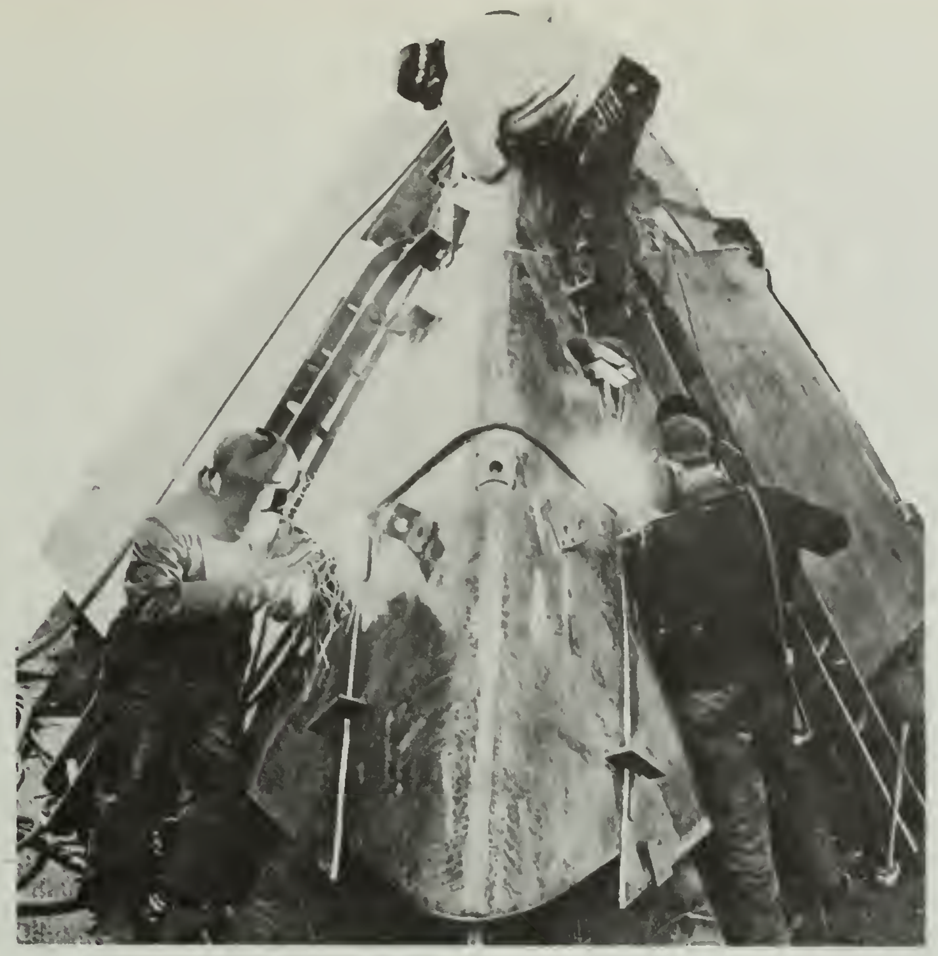
Probably the main lesson from the experience of the industrialized nations is "the later the better." That is, each nation learned to avoid some of the problems that England experienced. Each succeeding industrialized nation began with better machinery and better institutions to provide effective competition to the older industrialized nations. Economic historians identify among the causes of World War I and II the world-wide competitive challenge by the upstart, newly industrialized nations in the markets long monopolized by Great Britain.

In the Pacific Northwest the concern focused on how to get more industrial jobs without the smoke stack ugliness and brutalizing conditions of the older industrial areas. The concern was expressed in the mid-1930s with respect to preservation of the scenic values of the Columbia River Gorge, and to avoidance of industries that would pollute. Viewed in the perspective of the industrial revolution, the Pacific Northwest has substantially succeeded in achieving a modest level and diversity of industrialism without the evils of industrial slums.

Power was the key to England's industrial revolution. The Romans introduced water wheels to Britain. For centuries the British used charcoal to smelt and forge iron. The discovery of coal brought a double shift in technology, first improved smelting of iron and steel, and second the use of boilers to produce steam. One motivation for developing the steam engine was to pump water out of the coal mines. The development of the steam engine triggered a long series of mechanical improvements. England's industrial revolution was characterized by coal as the power fuel and the steam engine as the motive power.

A new perspective and the entire new group of electrical industries became possible with the beginning of the age of electricity in the 1880's.

The early electric utilities started as "light" companies,



Shipbuilding in the Pacific Northwest was a major war contribution. Upper photo shows a ship's bow being assembled, upside down. Lower photo shows bridge structure being hoisted into a new ship.

with virtually no industrial load. Most large industries generated their own electric power. For 30 years, from 1882 to 1912, industries in the U.S. generated more electricity than was produced by electric utilities. After 1912 the economics of scale of large central generating stations usually made it more advantageous for industries to buy electricity from the utilities. Electric companies changed their names to include "power" as well as light. By 1917 industries used 54 percent of all electric utility output and the figure hovered around 50 percent for many years. Currently, the USSR devotes about 75 percent of its electrical production to industry. A world-wide 1972 survey shows 70

percent of all electric generation going to industry. This suggests that the predominant, basic electric load has been industry.

Not every industry was equally welcome. As a rule the electric utilities served a multiplicity of small manufacturing companies, but were much more reluctant to serve large, high load factor electro-metal and electro-chemical plants, particularly aluminum reduction plants. Transit, subway, and electric railway loads were regarded as disturbing loads because of the load gyration. Pulp mills usually generated their own electricity incident to burning waste fuel to produce process steam.

By the early 1930's the advocates of Columbia River development had industrial loads very much in mind as shown in various reports of 1932-1937. The Army's 308 report of 1932, the Bureau of Reclamation's 1934 report on the Columbia Basin Project, the PNWRPC 1936 report and the FPC 1937 Bonneville rate study all underlined the need for a low rate to attract industry. Industry was regarded as the key to financial success of the Bonneville Project and to insure early loading of generators.

The Portland Chamber of Commerce felt that all of the Bonneville Dam output, except for the needs of the local private utilities, should go to new industry. In 1935 Bohn Aluminum and Brass Corporation contacted the Corps of Engineers and the Portland Chamber of Commerce with an inquiry about buying the entire output of Bonneville Dam for aluminum reduction. The inquiry drew a negative reaction from Oregon Congressman Walter Pierce and others. While the Bohn inquiry was premature, it presaged the eventual sale to aluminum companies of electric energy equivalent to five Bonneville Dams, amounting to about 86 percent of BPA's direct industrial sales.

The aluminum story closely parallels the age of electricity. Only four years after Edison started his Pearl Street station, Charles Martin Hall (1863-1914) patented the method for electrolytic reduction of aluminum from bauxite. That was 1886. Two years later, Hall suggested the formation of the Pittsburgh Reduction Company with a plant at New Kensington, Pennsylvania and in 1895 a 1,500 kW aluminum reduction load at Niagara Falls. The name was changed in 1907 to the Aluminum Company of America (Alcoa).

Prior to World War I Germany produced most of the world's aluminum. The U.S. became the leader during the 1920's, but production sagged during the depression to as low as one-third of Alcoa's annual production capacity of 130,000 short tons. Under Hitler, Germany tripled its production to 70,000 metric tons of aluminum in 1935, and by 1939 to 188,000, while the U.S. output reached only 148,000 metric tons. The significance of Hitler's interest in aluminum was not realized until later. During World War I the U.S., largely for military needs, had increased production from 26,000 metric tons in 1914 to 57,000 in 1918. That fact was not recalled in the U.S. in the 1930's.

Alcoa's profitability recovered in 1936 leading to expansion to 200,000 short tons of capacity in 1939. French and British orders for planes stimulated the increase. However, J. D. Ross did not encourage attracting Alcoa to the Pacific Northwest. On September 14, 1937, Ross wrote "...aluminum is not a large use of labor..." On November 11, 1937, Ross wrote David Joel Wolfsohn of the National Power Policy Committee that electro-metal development should come later when Coulee is finished.

In March 1938 Administrator Ross sent out thousands of questionnaires asking for public comments on proposed rates. One question was what percentage of Bonneville Dam power should be earmarked for industry. The average answer was 20 percent. In December 1938 in issuing BPA's first annual report, Ross looked favorably at industrial development and at national defense loads, but he pointedly omitted any mention of aluminum.

At his appropriations hearings both in 1938 and early 1939, Ross was pressed on the meager revenues. It was not his fault, of course, that the Bonneville Act was passed when the Bonneville Dam was almost ready to generate power. By dint of a crash construction program, the first line to Vancouver, Washington, was ready in December 1939.

In that month the new Administrator, Dr. Paul J. Raver, signed the December 20, 1939 contract with the Aluminum Company of America for 32,500 kilowatts for an aluminum reduction plant to be built at Vancouver, Washington. Anti-trust investigations of Alcoa led Raver to encourage other firms to produce aluminum, and to insist that the Defense Plant Corporation investments in aluminum production not be concentrated in one huge Alcoa plant, as was proposed, but be dispersed geographically among smaller plants which could be sold after the war so as to encourage competition in the industry. Despite this concern, the Alcoa contract was rapidly increased to 182,500 kW. Alcoa's leadership, however, induced other companies to consider the Northwest.

In the fall of 1942 President Roosevelt made an unannounced visit at the Vancouver Alcoa plant on the occasion of the second anniversary of the pouring of aluminum ingots at the new plant. Due to war-time restrictions, the visit was not publicized until a week later.

The primary national policy was to win the war, and BPA policy was not different. But BPA also had an eye to regional economic development, dispersal of industry, and ease of postwar adjustment. BPA conducted county economic studies, prepared industrial site surveys, and identified ways in which the region could assist in the defense buildup and in the war effort. As of June 30, 1942, industrial loads, all of them for war production, amounted to 92 percent of all contracts for 899,920 kilowatts, and other contracts were pending. Lillian Davis' draft of a manuscript, *BPA and the War,* as of mid-1944, concluded that BPA compressed ten years of growth into five years.

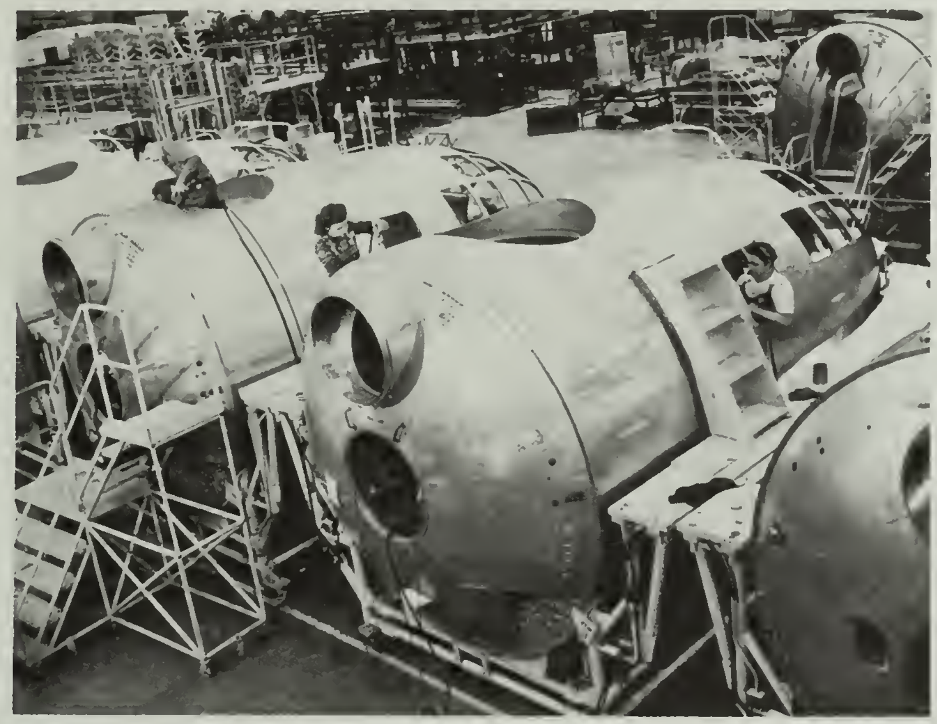
Most of BPA's national defense load was in aluminum reduction. The three major shipyards, however, provided the most jobs. In 1943 the Manhattan District of the Corps of Engineers built the Hanford Works and thereby set in motion a train of events which grew into the Tri-City complex with substantial employment.

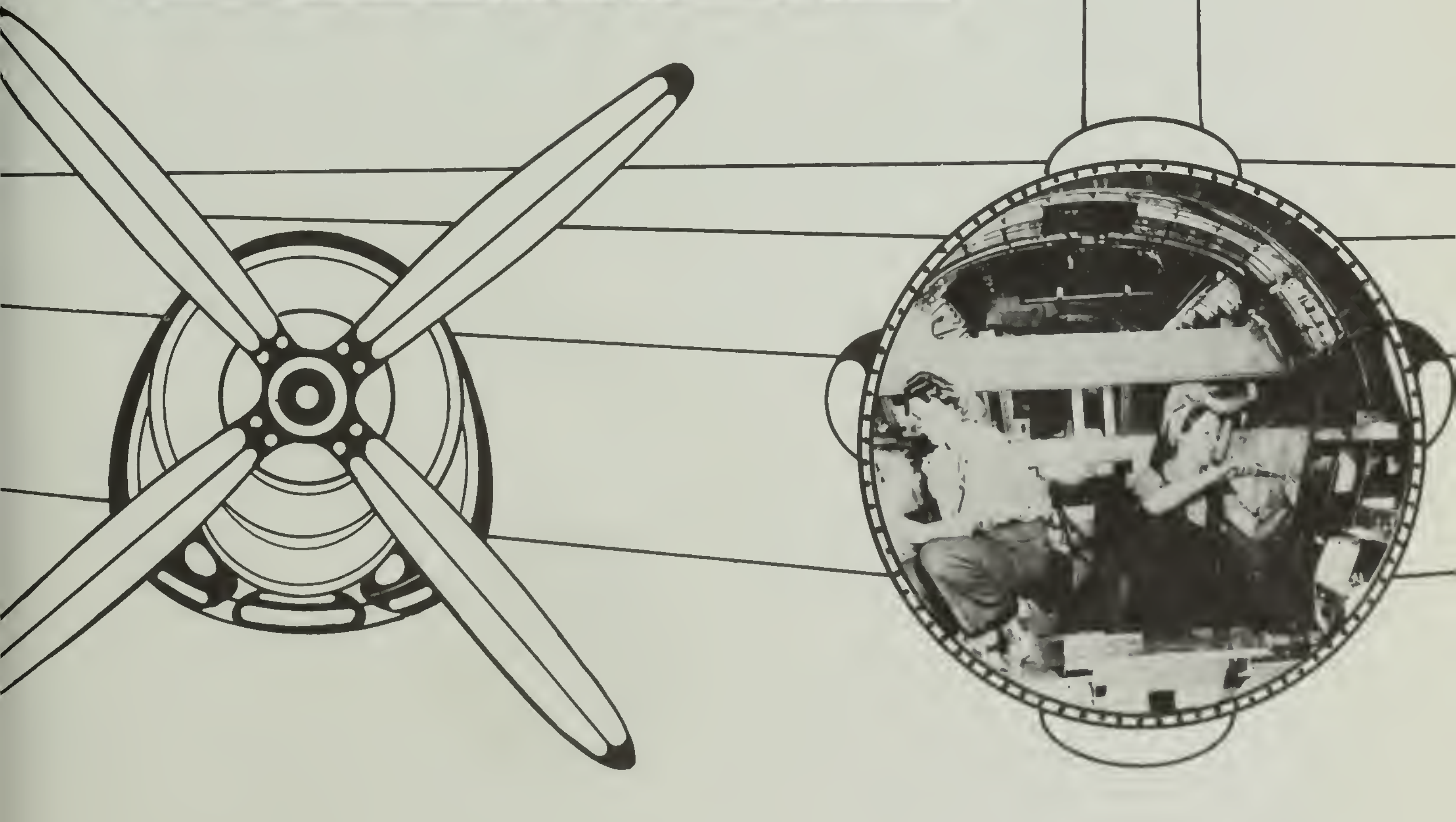
BPA's 1944 annual report mentioned allied victories on every battlefront foreshadowing an end to the war and a shift of attention to postwar planning. BPA suggested that the hydroelectric power resources held the key to further development of the region and BPA issued a prospectus entitled, *Pacific Northwest Opportunities* emphasizing the wide variety of industries needed in the Northwest. Instead of new industries coming, however, the region lost the huge payrolls of the shipyards and many other defense activities. Aluminum plants in late 1945 slashed production and laid off hundreds of workers. This in part led the private utilities to testify to Congress early in 1946 that the region had a million kilowatt surplus and therefore did not require additional dams. Administrator Raver took the lead in forming the Tacoma Conference which later became the Pacific Northwest Utilities Conference Committee. This group undertook the assembly of individual utility load estimates into a regional forecast, and then testified for new dams needed. Raver's chief problem with the group was to get them to include any allowance for major, new industry. He succeeded mainly because the large aluminum loads came back on the line within a year.

The postwar period saw the beginnings of BPA's own industrial sales policy. Until 1945 BPA had followed the dictates of national defense requirements. In early 1946 BPA decided to sell a block of 500,000 kW to reopen a number of aluminum plants. This decision locked BPA and the aluminum companies into a close relationship which

She was called Rosie the riveter and she built airplanes like the Boeing Superfortress.

resulted in several waves of expansion to double and redouble the aluminum load. The 1946 decision involved considerable coordination within the Federal Government against a background of anti-trust allegations leveled against Alcoa. The Defense Plant Corporation's aluminum plants were sold at bargain prices so as to invite new entrants to the aluminum reduction and fabrication field in order to establish competition. The sales were almost entirely in the Pacific Northwest where BPA could offer the $17.50 per kilowatt year rate.





Despite the lack of postwar jobs, most of the war time immigrants remained in the Pacific Northwest, swelling the ranks of the unemployed. BPA found itself more than busy, however, because of the restoration of the aluminum load, the start of the Columbia Basin Irrigation Project, continued growth at Hanford, and rural electrification. The aluminum payroll increased as more jobs appeared in secondary and tertiary fabrication of aluminum siding, windows, doors, truck bodies, campers, trailers, and a growing variety of items. In 1947 the 80th Congress directed BPA to abolish its power utilization staff headed by Ivan Bloch, advocate of industrial development. The power shortages of 1948 and 1952 meant that the system had reached full utilization of investment. And during this time net income reached as high as about 40 percent of gross.

By 1948 the installation of 15 generators at Grand Coulee had reached the point where the prime power available at Coulee was effectively harnessed. The last three generators installed by 1951, which signaled full production and full revenues, were peaking units and their output in the summer months was secondary power. This general change in the hydroelectric resource led BPA to make its first major change in the industrial sales policy. In 1948 it required that in future contracts with aluminum companies and other industrial firms using high load factor power, the companies must buy one kilowatthour of secondary or interruptible power with every three kWh of firm power. At first the secondary energy was sold with the understanding that it would be firmed up when new resources became available. In time this evolved into a policy whereby the 4th kWh was completely interruptible, and the other 3 kWhs were redesignated as modified firm which generally meant that short interruptions were allowed. In this sense almost all aluminum reduction load is interruptible.

The Korean conflict starting in mid-1950 necessitated another rapid defense build-up, especially in aluminum. BPA again caught the brunt and had to commit an added block of power for aluminum expansion.

In response to the Korean conflict BPA with approval of the Secretary of the Interior made an interesting decision in 1950. It authorized the sale of power for that year on the assumption of a median water year. A median water year produces much more energy than under low water year conditions. The gamble paid off. By 1952, however, the growing electric loads caught up with the lag in generator installations, resulting in a power shortage and curtailment of industrial loads.

18. ELECTRIFYING THE RURAL NORTHWEST

There was only one discordant note in that first (1924) stay of mine at Warm Springs. When the first of the month bill came in for electric light in my little cottage, I found that the charge was eighteen cents per kilowatthour – about four times as much as I was paying in another community, Hyde Park, New York. That light bill started my long study on proper public utility charges for electric current, started in my mind the whole subject of getting electricity into farm homes throughout the United States.

So, my friends, it can be said with a good deal of truth that a little cottage at Warm Springs, Georgia, was the birthplace of the Rural Electrification Administration.

– Franklin D. Roosevelt
Speech at Barnesville, Georgia
August 11, 1938

Marquis Childs said of rural electrification:

"It is one of the most impressive stories in the history of American agriculture and industry. What has taken place is a peaceful revolution transforming farm life in America" (p. 72).

His 1952 book, *The Farmer Takes a Hand,* contains a chapter on electrifying rural areas of the Pacific Northwest. In 1979 Marquis Childs revisited the Pacific Northwest in connection with updating his 1952 book on rural electrification.

John Gunther in the 1951 revision of his 1946 book, *Inside U.S.A.,* viewed rural electrification as social progress:

"The work of the...Rural Electrification Administration to improve (the) situation and bring power into farming areas has been one of the most stimulating successful adventures in social progress made in this country in many years." (p. 142)

At another point he wrote:

"A family with rural electrification is at one jump removed from peasanthood" (p. 336).

He devoted a special chapter to BPA entitled, "Highways in the Sky," referring to BPA transmission lines. He praised the Bonneville Project Act as social legislation, citing the widespread use objective and the preference clause:

"The act creating the Power Administration was passed by Congress in 1937 and is one of the most striking pieces of social legislation in the history of the United States" (p. 129).

This optimism and praise for the success of rural electrification stands out against a backdrop of almost half a century of neglect, doubt and pessimism. There were some early exceptions to the dim view of electrifying rural America. As early as 1899, electric motors were used to drive pumps for farm irrigation in Tulare County, California. National Electric Light Association committees reported favorably on possible farm uses of electricity, notably in 1910 and 1923.

Despite such exceptions, investor-owned utilities viewed farms mainly as a very small electric lighting load. They set rural service rates high and insisted on a cash contribution, generally equal to the cost of extending the line to serve them. It was a long time before the value of using electricity was recognized in powering motors, and increasing farm production and income.

Morris L. Cooke launched the Rural Electrification Administration in 1935-1936 after many years of study and advocacy. In 1950 he chaired Truman's Water Policy Commission.

Morris L. Cooke, Philadelphia Public Works director in 1913, became interested in rural electrification through his studies of electric distribution costs, distinguished from generation and transmission costs. With scientific management methods in mind, he visualized streamlining the cumbersome, heavy-duty urban distribution system to serve rural areas, and thereby reduce the cost of rural electrification.

In transmitting the Giant Power Survey Board's report to the General Assembly of Pennsylvania in February 1925, Governor Pinchot recommended the "systematic extension of service lines throughout the rural districts." His recommendation was based on the 480-page report prepared under the direction of Morris L. Cooke. The report includes a 21-page bibliography which reflects the extensive interest in electricity and particularly rural electrification, including the papers at the First World Power Conference of 1924 and the forthcoming Annals of March 1925, on the theme of Giant Power, of the American Academy of Political and Social Science, of which issue Cooke was editor. Many articles, speeches, and chapters report on the success of rural electrification in Europe, New Zealand, and Canada.

When Governor Roosevelt signed the New York State Power Authority bill in April 1931, Cooke became a commissioner. In that position, he sponsored a study of electric distribution costs for rural areas.

In the early days of rural electrification many farmers hitched up their teams and helped clear right-of-way, set poles, and string conductors.

The October 1934 report of the Mississippi Valley Committee, chaired by Cooke, had a strong chapter on power. It called for multi-purpose hydroelectric projects, transmission grid systems, and rural electrification, the latter under Federal leadership. It noted the benefits of power

development and rural electrification:

"Of the returns in terms of social well-being, national safety, agricultural and industrial advance, and of individual happiness and security, there is no yardstick adequate for the measuring" (p. 53).

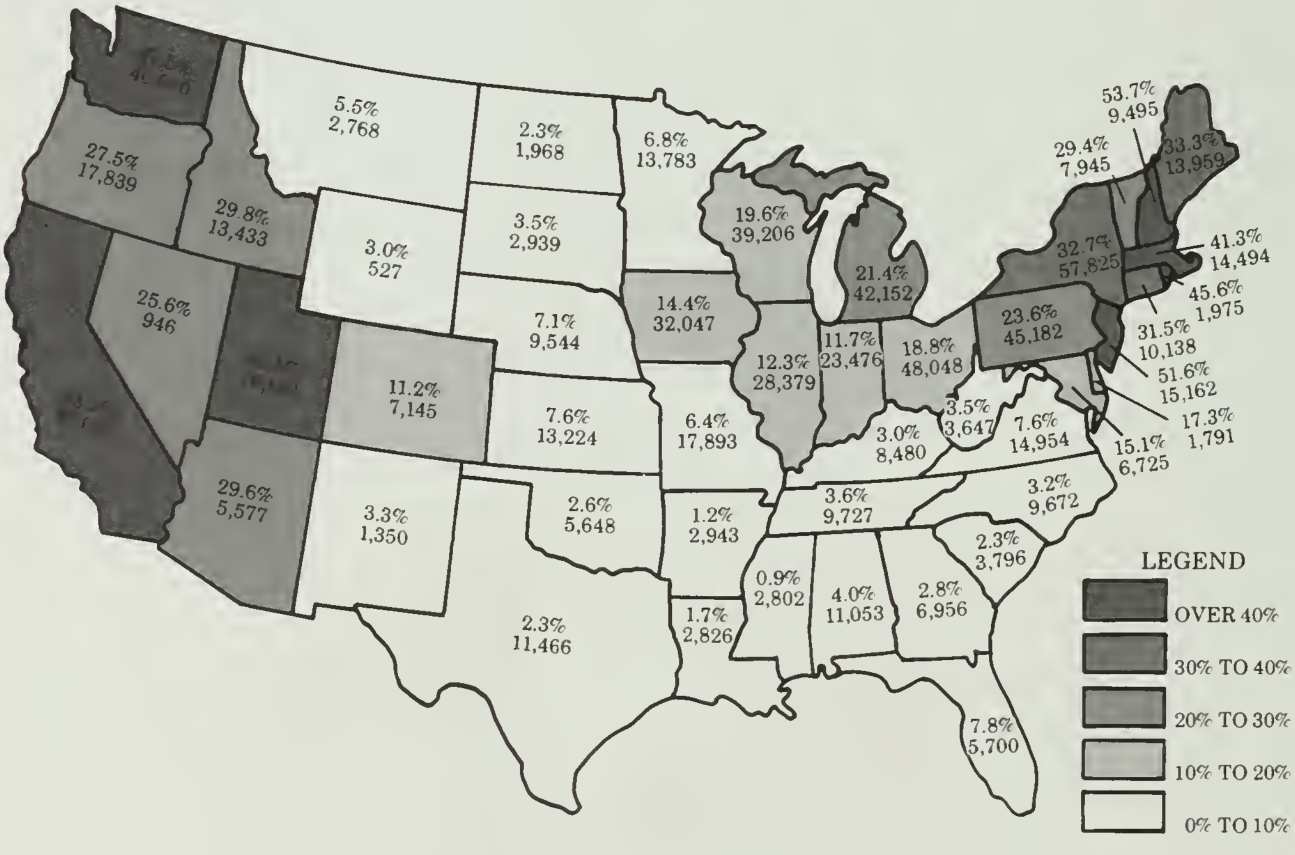
Congress included rural electrification as a project category in the Emergency Relief Appropriation Act of April 8, 1935. President Roosevelt used this Act as authority for establishing the Rural Electrification Administration under Executive Order 7037 on May 11. He appointed Cooke Administrator on May 20. Cooke referred to May 11 in his first annual report (January 20, 1937) as a milestone date:

"For the first time, thousands of our rural communities have had hope of securing electricity" (p. 1).

The first annual REA annual report featured a map of the extent of farm electrification as of 1934 ranging from 53 percent in California to 0.5 percent in Mississippi, and averaging 10 percent for the nation.

PERCENT OF FARMS ELECTRIFIED BY CENTRAL STATIONS

AND THE NUMBER OF FARMS SERVED IN EACH STATE



Many states submitted applications for construction loans to the agency during its first year. As the program gained public support, Congress enacted the Rural Electrification Act of 1936, establishing a 10-year loan program.

Cooke retired as REA Administrator early in 1937. Kenneth E. Trombley quoted Eleanor Roosevelt in his 1954 biography of Cooke:

"There is little doubt that one of Mr. Cooke's greatest accomplishments to his Nation has been his contributions to the development of rural electrification. One cannot measure the extent to which back-breaking burdens have ceased to be a part of the farmer's daily existence through electrification. One cannot measure what electricity has done to give the farmer's wife and family better health, greater happiness, and, probably more important than all, human dignity" (p. 250).

The national rural electrification program did not exclude existing utilities. Cooke believed private and municipal utilities would apply for loans, but he was disappointed.

Cooperatives evolved as a last resort. They were welcomed by private utilities in some states and bitterly opposed in others, particularly in California, Rhode Island, Massachusetts, and Connecticut. Companies stepped up rural electrification enough to prevent establishment of cooperatives in the better service areas. In the Pacific Northwest the idea of rural electric cooperatives, called "mutuals," was long known in the Burley, Idaho and Tacoma, Washington areas, where at least a dozen co-ops began supplying electricity from 1914 to 1925, long before this became a national movement.

The REA Administrators' annual reports show the progress of rural electrification year by year and state by state, often in the face of many challenges. The War Production Board halted construction of rural lines July 20, 1942 because of material shortages. It revised the order in January 1943 to permit short rural line extensions if they would enable farm production to be increased.

In 1944 REA drafted a 5-year post-war electrification program. It earmarked $1 billion in REA loans for facilities and anticipated $4.5 billion in consumer purchases of wiring and appliances. Congress responded by enacting the Pace Act of September 22, 1944, reducing the REA interest rate to 2 percent and extending the amortization period to 35 years. In signing the bill, President Roosevelt pointed out that the Act would:

"...make it possible to bring electricity to many more thousands of farm homes which could not previously be served."

When Germany capitulated in 1945, the War Production Board lifted restrictions on materials for building rural lines. REA Administrator Claude Wickard prophesied:

"Now we are on the threshold of the greatest period of activity in REA's history."

REA loans financed facilities to connect 514,311 consumers in the record year, July 1, 1948 to June 30, 1949. Despite material shortages and funding limits, REA borrowers connected nearly 2 million consumers in the five post-war years. The number of consumers connected to REA borrower systems increased from 1.287 million in 1946 to 3.252 million in 1950. More than 8 million consumers now are served by systems which the REA has lent more than $10 billion in 40 years, or for which it has guaranteed other loans.

The national rural electrification goals have been substantially achieved. Some 99 percent of the nation's farms now have electricity.

From its beginning, REA has based loans for distribution facilities on the assumption that the borrower would purchase power from an existing supplier. Many REA borrowers in the TVA area and western states obtained power from Federal installations. Virtually all REA borrowers in the Pacific Northwest purchase BPA power, thus enjoying some of the lowest wholesale power rates in the world. The low BPA rates often proved crucial in studies on the feasibility of connecting rural consumers.

The success of rural electrification in the Pacific Northwest involved close cooperation between REA and BPA, one providing low-cost loans, and the other low-cost power. Vigorous leadership and the fine teamwork of REA and BPA resulted in joint accomplishments.

The REA Act and Bonneville Project Act grew out of the strong national interest in the power issue, the vigorous leadership of President Roosevelt and National Power Policy Committee members, and support of the public power block in Congress. Historically, rural electrification in the Pacific Northwest since 1937 has been inextricably bound up with Columbia River hydroelectric development and BPA's history and success.

The major role BPA was to play in rural electrification began when Administrator Ross obtained $10.75 million in public works funds in 1938 to built transmission lines. This gave BPA a strong start toward building up its construction organization, constructing the Bonneville-Coulee

Two Indians look over the stock of electric home appliances. The lower scene shows Nespelem Valley Electric Cooperative Manager Harry Butler getting advice on where to run the new electric service.

intertie, the Bonneville-Vancouver line, and the customer service facilities to Eugene, The Dalles, and Aberdeen.

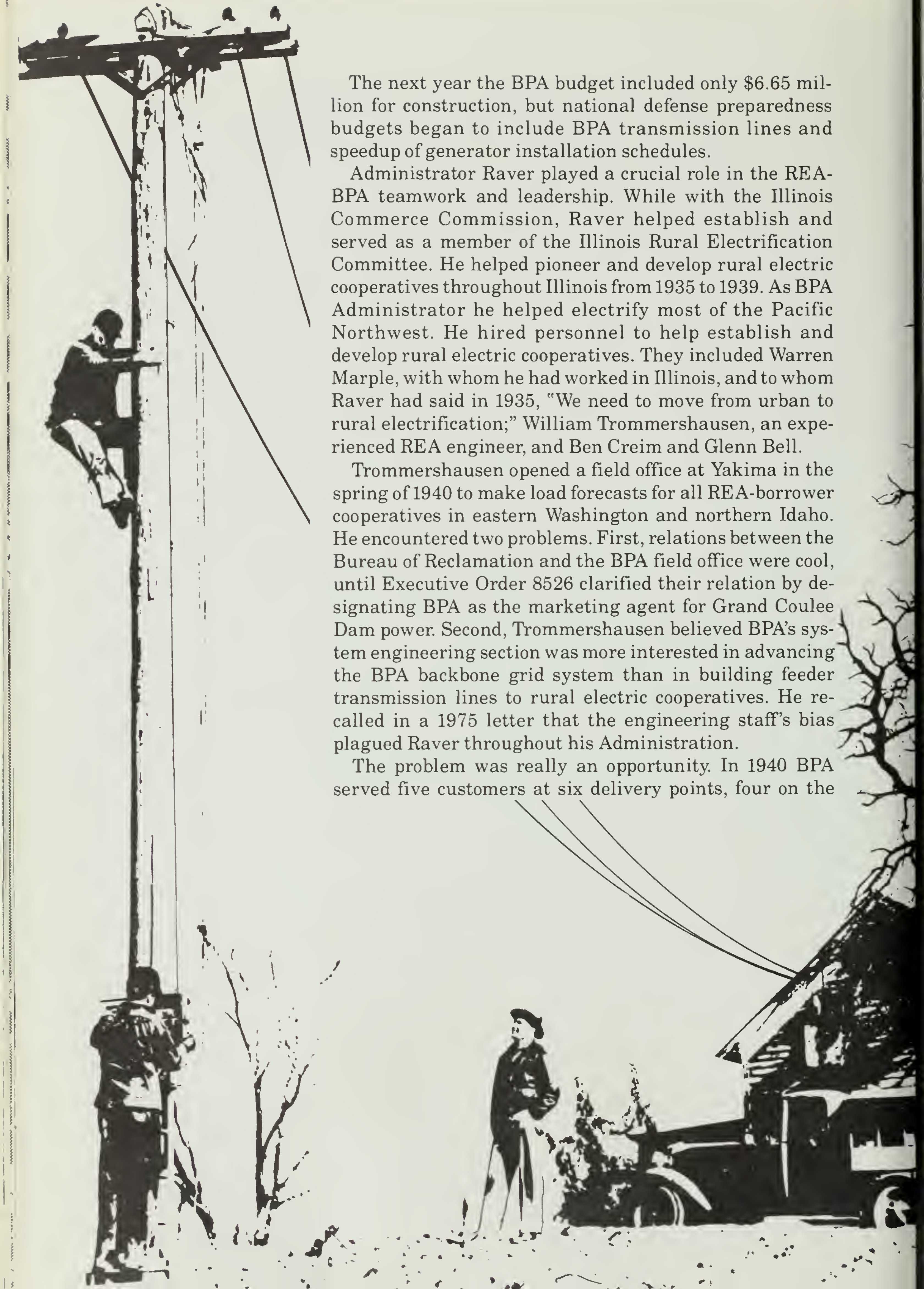
Long before these lines were energized, BPA learned its program did not enjoy universal support. There were moves in both the House and Senate in the spring of 1939 to reduce the BPA budget. They failed.

The next year the BPA budget included only $6.65 million for construction, but national defense preparedness budgets began to include BPA transmission lines and speedup of generator installation schedules.

Administrator Raver played a crucial role in the REA-BPA teamwork and leadership. While with the Illinois Commerce Commission, Raver helped establish and served as a member of the Illinois Rural Electrification Committee. He helped pioneer and develop rural electric cooperatives throughout Illinois from 1935 to 1939. As BPA Administrator he helped electrify most of the Pacific Northwest. He hired personnel to help establish and develop rural electric cooperatives. They included Warren Marple, with whom he had worked in Illinois, and to whom Raver had said in 1935, "We need to move from urban to rural electrification;" William Trommershausen, an experienced REA engineer, and Ben Creim and Glenn Bell.

Trommershausen opened a field office at Yakima in the spring of 1940 to make load forecasts for all REA-borrower cooperatives in eastern Washington and northern Idaho. He encountered two problems. First, relations between the Bureau of Reclamation and the BPA field office were cool, until Executive Order 8526 clarified their relation by designating BPA as the marketing agent for Grand Coulee Dam power. Second, Trommershausen believed BPA's system engineering section was more interested in advancing the BPA backbone grid system than in building feeder transmission lines to rural electric cooperatives. He recalled in a 1975 letter that the engineering staff's bias plagued Raver throughout his Administration.

The problem was really an opportunity. In 1940 BPA served five customers at six delivery points, four on the



BPA transmission system and two via transfer over other systems. Presently, BPA serves some 650 delivery points, a fourth of which are by transfer. Each delivery point had to be built or arranged case by case, and reviewed every few years. New points of delivery often involved controversy. Most of them involved lower voltage, usually 115,000-volt lines and were known as "customer service facilities" as distinguished from "backbone" transmission facilities of 230,000 volts and over. The distinction has been crucial in BPA history.

Politically, private electric companies in the region supported construction of most Federal hydroelectric projects and "backbone" transmission lines, including high-voltage lines to major load centers of the large utilities. On the other hand, they initially opposed BPA's proposed customer service facilities to preference agencies, including cooperatives, located within a private utility's general service area, even when the cooperative intended to provide electricity to unserved farms and rural areas.

The successful extension of service to rural areas depended on transmission facilities. In building these lines or negotiating satisfactory transfer arrangements, BPA made a vital contribution to electrifying the rural Northwest. The opportunity of negotiating transfer between BPA and private utilities helped to change political disagreement into a mutually beneficial solution of an operating problem.

BPA's post-war plans focused on two main problems: first, the desire to retain electrometal and electrochemical plants which had come into the region during the war, and second, the need to respond to the pent up demand for customer service transmission facilities, particularly for rural electrification. Aside from a sharp temporary drop in industrial loads in 1945, BPA succeeded in retaining the electroprocess plants. BPA initially was successful in extending customer service lines, largely because of carryover appropriations which had not been used during the war years due to material shortages. When the carryover funds ran out, BPA had to request appropriations and face opposition.

After completing his military service in May 1946, Trommershausen rejoined the BPA staff and was assigned to expedite construction of several customer service transmission lines. Next he designed a 115,000-volt line between Spokane and Lewiston and Grangeville.

When Administrator Raver included the line in the BPA budget, The Washington Water Power Company agreed to transfer power for BPA to all rural electric cooperatives in its service area. This progressive step was a precedent for

Ben Creim

subsequent transfer arrangements. It also prompted Raver to establish other BPA district offices to work with local public, private, and cooperative utilities, and with direct-service industries. As the offices planned service, local electric systems testified for the needed facilities. The local political support became a factor in the BPA program. That was the key lesson. Each line had to have political support. From his Spokane duty, Trommershausen was sent to Eugene as district officer to plan customer service for central and western Oregon, mainly to aid rural electrification.

The election of the 80th Congress in November 1946 set the stage for a traumatic shock for the BPA program and staff. Even before that, BPA's ambitious fiscal year 1947 budget was cut to $12.47 million. The next year the operations and maintenance budget dropped from $4.7 to $2.5 million, and 600 employees were laid off. Construction funds were cut from $20.278 million to $6.096 million (later increased to $7.28).

However, two crucial customer service lines for the Idaho Panhandle and southwestern Oregon were approved following a House floor fight. The proposed lines were located in Republican Congressional districts. The victory became the basis for increasingly important Republican Party support in the Pacific Northwest, particularly in Oregon. Later, some of the budget cuts were restored.

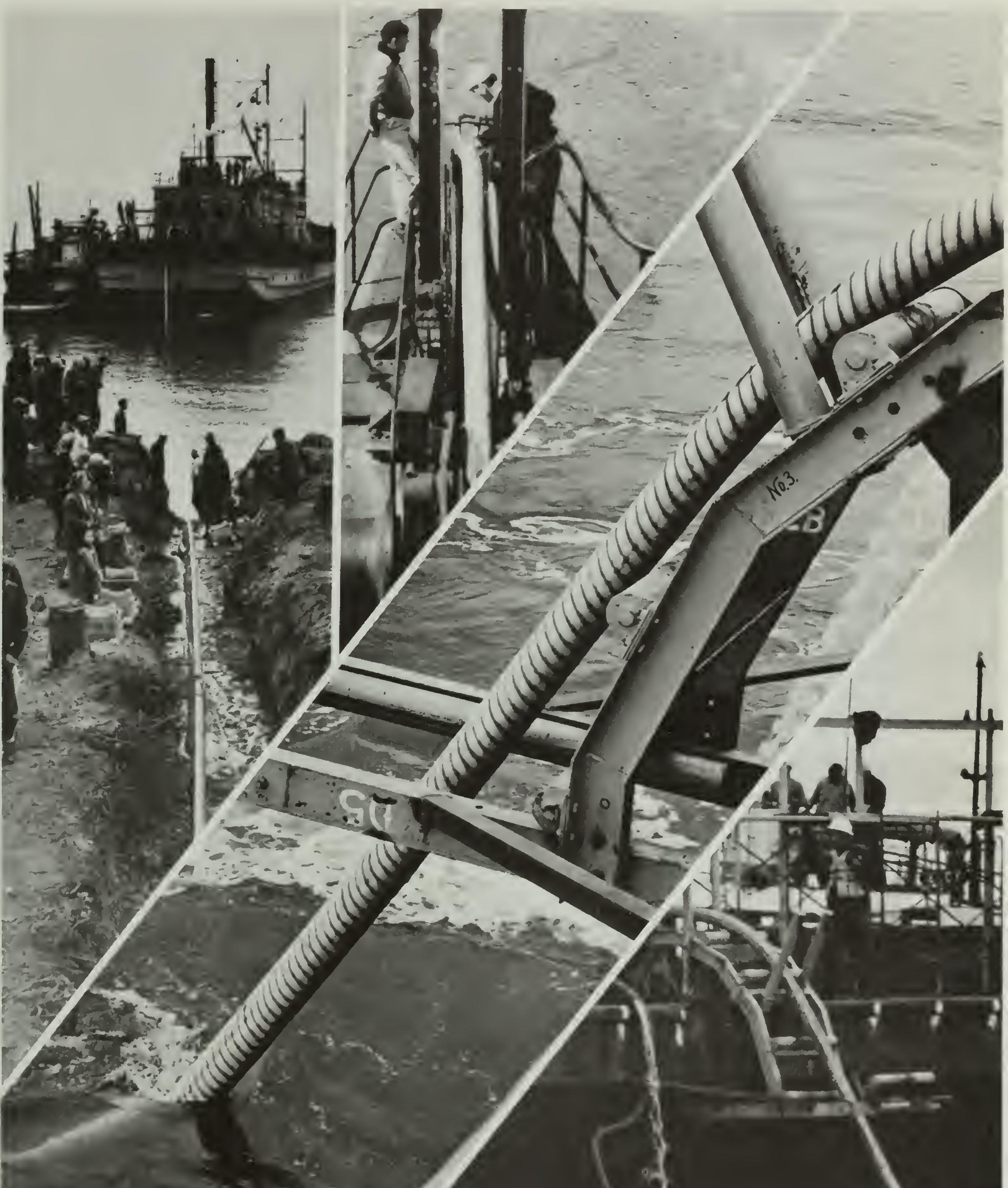
Because of its experience with the first session of the 80th Congress, BPA learned to work for bipartisan political support, especially in recommending customer service facilities for rural electric systems. The second session of the 80th Congress granted BPA $3.23 million for operations and maintenance and $17.9 million for construction for fiscal year 1949.

Another major advance was Congressional approval of high-voltage lines in connection with Hungry Horse Dam in northwestern Montana. This enabled BPA to integrate the project into its grid and serve two Montana industrial loads, provide 50,000 kW for The Montana Power Company, and arrange for it to transfer BPA power to four electric cooperatives in western Montana. A 1975 Ph.D. thesis commented on BPA in western Montana and the Bureau of Reclamation in eastern Montana:

> "Bonneville and the Bureau have played as great a part in the success of the rural electrics as has the REA." (Busch, 1975, p. 308)

Watching the cable laying operation as BPA extends service to the San Juan Islands.

The many other customer service facilities and arrangements that followed provided low-cost electric service to southern Idaho and the Pacific Northwest's outer-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most fringes. Providing service to the San Juan Islands was particularly challenging.

San Juan County consists of 174 forested islands in northern Puget Sound. The mild, maritime climate and extensive fish runs attract many small boaters and other vacationers. Residents formed the Orcas Power and Light Company (OPALCO) as a rural electric cooperative in 1937. REA loans financed installation of diesel engines and distribution lines, and underwater cables to interconnect the six major islands. Electric rates started at 8 cents per kWh for the first 100 kWh. per month.

BPA made its first feasibility study in 1940 for installing a heavily armored underwater cable 4.2 miles long from the mainland to Decatur Island, and a second 12,000 feet long from Decatur Island to Lopez Island. It deemed the installations were not feasible, and the war delayed further consideration of the project.

BPA finally laid a three-phase 25,000-volt cable April 16-17, 1951 at a cost of $600,000 to provide low-cost hydro power to OPALCO. Rate cuts followed and electrical use increased. But service depended on one cable subject to damage from strong tidal currents and ships' anchors.

Costly cable failures in 1964 and 1965 persuaded BPA to lay a second cable in 1966 at a cost of $1.4 million. The first cable was retired in 1969 after two more failures. BPA laid a third cable in 1972 at a cost of $1.5 million, mainly to improve service reliability. BPA's investments for system improvements and outage costs on behalf of OPALCO have exceeded $5 million. In addition, OPALCO has substantial investments in interisland cables and distribution facilities.

Providing service to the San Juans was a case of BPA "going the last mile" to achieve regionwide coverage and rural electrification. OPALCO, REA, and BPA together overcame severe physical and engineering problems. Financial feasibility or "break even" may never be reached by BPA on its San Juan investment. But BPA did meet the challenges to get electricity to the people!

Raver often spoke at annual membership meetings of Pacific Northwest rural electric cooperatives, and at conventions of rural electric associations. Mrs. Raver recalls going with him on many of these shorter trips and spending her time visiting with farm wives as they told of the long years of waiting for electricity and what a change it made (Interviews 1975). She felt that her husband derived some of his major satisfactions as BPA Administrator from seeing what the coming of electricity meant to farm families. He felt this made BPA a program for the people.

19. PERSONNEL POLICY

History is the essence of innumerable biographies.
– *Thomas Carlyle*

BPA generally operates like other Federal agencies in respect to personnel matters. It follows U.S. Civil Service Commission laws and rules. Some of its policies and practices, however, are common to the electric utility industry. This chapter concerns the collision course between the accepted 1938-1945 personnel rules of a Federal agency and the proprietary and industrial nature of a utility constructing, operating, and maintaining an electric transmission system. Out of this dilemma BPA forged its labor-management policy.

Federal personnel policy evolved from a checkered past. Until at least 1883 the system of political patronage was the rule. In an 1832 Senate speech New York Senator William L. Marcy defended political patronage saying "to the victors belong the spoils of the enemy." When President James A. Garfield was shot July 2, 1881 by Charles J. Guiteau, a disappointed office seeker, the cry went up for reform.

Senator George Hunt Pendleton of Ohio, chairman of the Senate Committee on Civil Service, sponsored the Civil Service Act of 1883. The new law so antagonized the "spoilsmen" that they helped defeat Pendleton when he ran for reelection in 1884. He became the minister to Germany, where he died in 1889. The U.S. Civil Service Commission in 1963 honored Pendleton by naming after him its history room and civil service research center.

During the ensuing half century from 1883 to 1933 the mainstream of personnel management evolution was not in government but in industry. Frederick Winslow Taylor (1856-1915) advanced his concept of scientific management, also called Taylorism. He emphasized mechanical factors in productivity, work flow studies, organization, training and quantitative incentives such as piece work pay and working conditions. He analyzed jobs with a stop watch, much to the displeasure of labor unions.

The perspective shifted in 1925 with the Hawthorne experiment at the Western Electric Company Hawthorne Plant in Chicago. In their analysis of the experiment F. J. Roethlisberger and Elton Mayo of Harvard University concluded that humane treatment and psychological factors predominated in influencing productivity. This launched the humanism movement or human behaviorism. Humanistic or qualitative factors include recognition by superiors, teamwork and team spirit, job challenge, delegation, pride of workmanship, sense of accomplishment.

Efforts of Federal postal workers to unionize and attempt negotiations were resisted by the issuance of "gag" orders in 1895 by President Cleveland, 1902 by President Theodore Roosevelt, and in 1909 by President Taft. Congress passed the Lloyd-LaFollette Act of August 24, 1912 to nullify the gag orders and to restore the right of petition. In 1919 when Assistant Secretary of the Navy Franklin D. Roosevelt learned that Navy Yard officers were refusing to receive complaints, he issued a letter August 5, 1919 directing that shop committees "are always to be received and listened to."

The Franklin D. Roosevelt Administration gave strong impetus to public employment and the ideal of public service. Many new Federal agencies came into being. Recalling the successful use of government corporations for defense purposes in World War I, Roosevelt established a number of Federal corporations with flexibility to conduct business transactions. As defense activities accelerated in 1940 he recruited experienced city managers to build and operate the Army cantonments. The traditional civil service system of chief clerks gave way to administrative officers and many other new job titles. This all gave rise to the formulation of a new field of management: public administration. Many called it the fourth branch of the Federal Government. Harvard University, long devoted to training people for private business, decided in 1937 to establish a graduate school of public administration, focused on public policy, including fiscal policy. This contrasted with the long established Syracuse University program which viewed administration under the acronym POSDCORB, coined by Luther Gulick in 1937, meaning planning, organizing, staffing, directing, coordinating, reporting, and budgeting.

In its first decade BPA applied the principles of public administration, oriented to the social and economic objectives of the Act. Launching and organizing a new agency, preparing to serve large national defense loads, winning the War, and then extending the system to electrify rural areas – all these provided challenges and strong incentives. Raver adopted many of the new techniques, including decentralization, delegation of authority, and management by objectives. In recruiting people Raver stressed BPA's public service role.

The large BPA posters, 17″ by 22″, featuring "Our Objectives" appeared in every BPA office and substation in 1950.

They symbolized the motivation and illustrated Raver's management style.

Nonetheless BPA found itself circumscribed and hemmed in by personnel problems. The agency had two kinds of people, civil service and wage board or craftsmen, generally white collar and blue collar. In 1937 the Federal Government had little experience with industrial type employment. Civil service benefits generally did not extend to the crafts. The temporary hourly employees did not qualify for pensions, social security, unemployment compensation, or tenure.

Meanwhile similar craftsmen of large electric utilities enjoyed many benefits and security. The public versus private power debate accentuated BPA's problem as the utilities in Oregon and Washington competed for labor support by recognition of unions and collective bargaining. In contrast BPA was caught in the less responsive civil service red tape. Raver recognized a collision course situation. He reduced his exposure by contracting out major construction projects, but craftsmen were also needed for BPA operations, maintenance, and specialized construction.

Most of the craft unions met in Vancouver, Washington January 1941 to form the Columbia Power Trades Council patterned after the successful Tennessee Valley Trades Council. Not much happened during the War years, but in December 1944 CPTC formed a committee to meet with Dr. Raver to discuss possibilities for an agreement. In January 1945 Raver appointed a management committee to join in exploring the possibilities. After many meetings, a generalized agreement was signed May 2, 1945 involving 16 craft unions. After reciting BPA's public purposes, the agreement enunciated the following objectives:

Section 2.2:

"The Administrator and the council further recognize that cooperation by the Administrator and the employees on the basis of mutual understanding between them arrived at through the process of collective bargaining is indispensable to the accomplishment of those public purposes.

Section 3:

"The Administrator and the council also recognize that they have a common and sympathetic interest in the power industry in the Pacific Northwest and its development and that the promotion of their common interests will be furthered and extended by the establishment and maintenance of labor-management cooperation between the Administration and the employees.

Section 4:

"Therefore, the Administrator and the council hereby agree to establish the conference and consultative machinery and procedure hereinafter provided for the following purposes: (1) To provide for fair and reasonable rates of pay, hours, and working conditions for the employees concerned in the territory in which the Administration's activities are or may be carried on; (2) to insure the making of appointments and promotions on a merit basis; (3) to promote stability of employment and to establish satisfactory tenure; (4) to provide for improvement and betterment programs designed to aid the employees in achieving their acknowledged and recognized objectives; (5) to promote the highest degree of efficiency and responsibility in the performance of the work and the accomplishment of the public purposes of the Administration; (6) to adjust promptly all disputes arising between them, whether related to matters covered by this agreement or otherwise; (7) to promote systematic labor-management cooperation between the Administration and its employees, and (8) to aid the reestablishment in civilian life of returning veterans."

The 1945 agreement consisted largely of an expression of intent. However, results soon followed. President Truman signed into law an amendment to the Bonneville Act on October 23, 1945 (P.L. 201-79/1) authorizing BPA to cover trade and craft employees under social security and to contribute to state unemployment compensation programs. The law enabled BPA to resolve other problems. The 1945 events came none too soon. The next two years brought much labor unrest and strikes nationwide.

The agreement evolved year by year as an umbrella under which many committees could function to solve problems and settle disputes in regard to safety, apprenticeship programs, training programs, working rules, employment of minorities and women, and the many other labor-management relationships.

This organizational pattern for the blue collar workers also interested white collar employees, who first obtained recognition of individual unions as early as 1948 and then established the Columbia Power Annual Employees

These pictures of the 1940's illustrate some activities of BPA employees. The group of young ladies became BPA messengers early in World War II, helping to set a trend toward increased employment of women. The BPA chorale group was in popular demand. In 1947 BPA employees won the grand sweepstakes for their float in the Portland Rose Parade.

1943 1944 1945 1946 1947

Council which was given exclusive recognition in 1970 under E.O. 11491.

In 1950 Montana Senator James E. Murray, Committee on Labor and Public Welfare chairman, authorized the preparation of a report on "Labor-Management Relations in the Bonneville Power Administration." In the resulting 70-page report (S. Doc. 192-82/1 of March 1951) Senator Murray stated:

> "During the past year the Subcommittee on Labor-management Relations has investigated a number of industries in which labor relations are bad. ***It is therefore refreshing and reassuring to learn, and I am happy to report, that in the Bonneville Power Administration relations between the management and its employees are good. ***Indeed labor-management relations in the Bonneville Power Administration can well serve as a model, not only for Government agencies, but for private industry as well."

Moreover the Committee reported BPA's good employee relations represented a substantial turnaround.

Since 1950 more improvements have occurred for both civil service and craft employees. A stronger U.S. Civil Service Commission (USCSC) resulted from recommendations of the Commision on Organization of the Executive Branch of the Government (Hoover Commission) and subsequent legislation. The Department of the Interior issued a comprehensive code of labor relations procedures, which incorporated many of the BPA lessons.

Within a month after assuming office President John F. Kennedy issued Executive Order 10918 of February 16, 1961 establishing the President's Advisory Committee on Labor Policy. On June 22, 1961 Kennedy appointed the President's Task Force on Employee-Management Relations in the Federal Service, headed by Secretary of Labor Arthur J. Goldberg. The Task Force reported November 30, 1961, *A Policy for Employee-Management Cooperation in the Federal Service.* On December 5th the President directed preparation of an implementing order. On January 17, 1962 he signed Executive Order 10988 entitled Employee-Management Cooperation in the Federal Service. This became the landmark. It opened the door for collective bargaining throughout the Federal Service, and authorized a code of fair labor practices. The President's Memorandum of May 21, 1963 approved the Standards of Conduct for Employee Organizations and the Code of Fair Labor Practices in the Federal Service.

President Lyndon B. Johnson on September 8, 1967 appointed the President's Review Commitee, chaired by Secretary of Labor W. Willard Wirtz. This continued in the spirit of the Kennedy E.O. 10988.

President Richard M. Nixon created a President's Study Committee headed by USCSC Chairman Robert E. Hampton. Its report of August 1969 was reflected in the Nixon Executive Order 11491 of October 29, 1969 which superseded E.O. 10988. It became effective January 1, 1970 and amended several times since. The Nixon order is somewhat more conservative and more management oriented, but otherwise is in keeping with Kennedy's basic order recognizing collective bargaining.

In his 1976 book *Labor Relations in the Federal Government Service,* Murray B. Nesbitt includes a chapter "The Department of the Interior — Bonneville Power Administration." It praises BPA labor contracts as models for other Federal agencies under E.O. 10988, and also because BPA contracts in the period 1945 to 1962 had been models for use in the Department of the Interior, notably by the Bureau of Reclamation.

People make an organization. High performance of people depends on the many ingredients, quantitative and qualitative, that make up the drive of human motivation.

Some people have devoted their entire working careers to BPA. Interviews with the old-timers, retirees and some who left BPA before normal retirement reveals much nostalgia, happy memories, and the satisfaction of having taken part in something worth while.

One cannot but be impressed with the dedication and high morale of BPA employees over the years. People have made BPA, and BPA has developed people. One retiree said of Raver, "His greatest achievement was developing people."

Raver, as the son of a street car conductor, had a personal sympathy for the working man. He certainly recognized the value of labor's political support for public development of a natural resource. His prompt action toward collective bargaining in 1945 was also good politics.

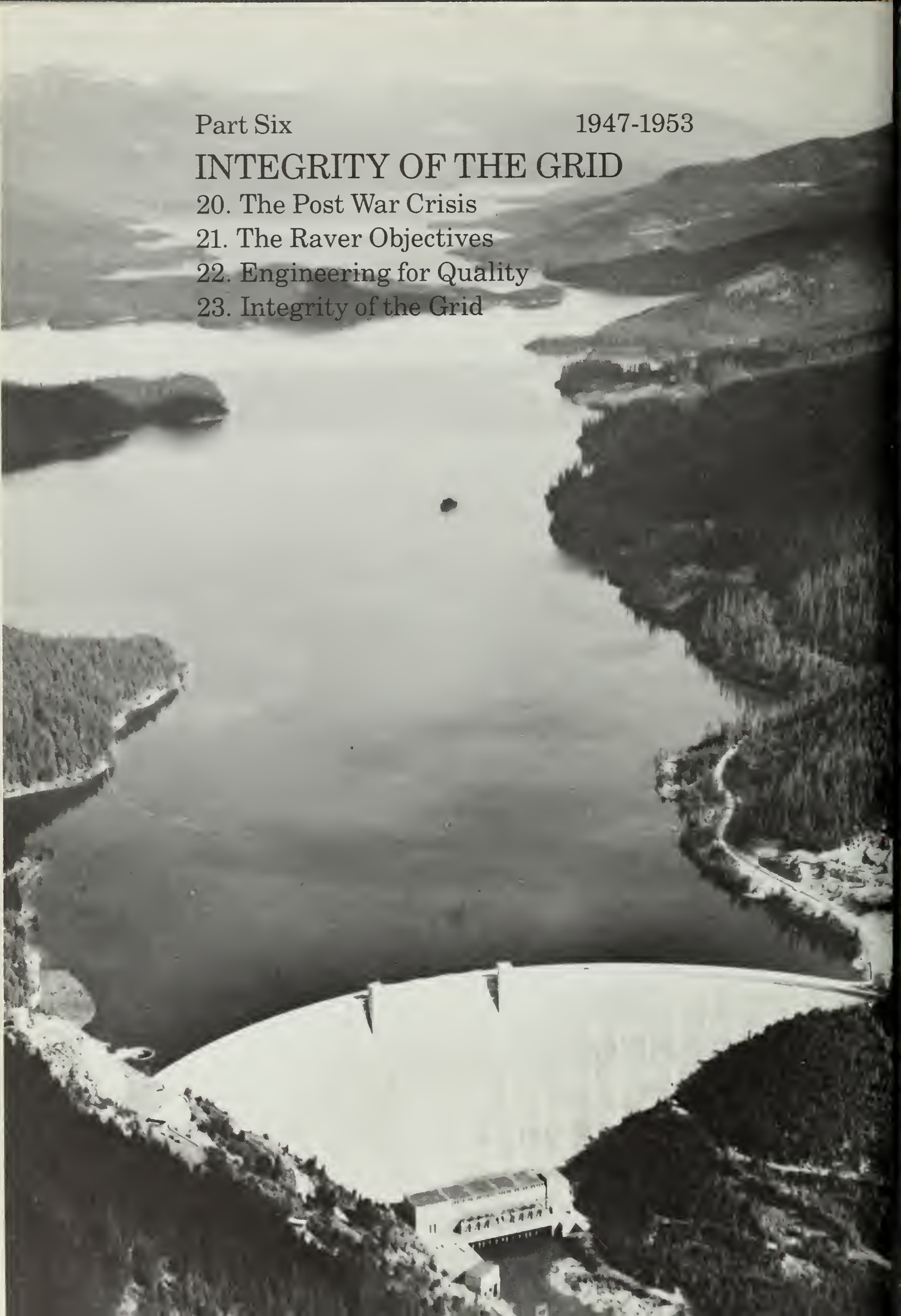
BPA's pioneering innovations of 1945 have long since become rights. They stood the tests of a third of a century. BPA faces new challenges in employee-management relations and will continue to seek solutions. Some imbalance of pay scales among employees is a current area of quantitative concern.

The more important area, however, continues to be qualitative. The motivation of public service, in pursuit of the social and economic objectives of the Bonneville Project Act, is BPA's foremost personnel policy.

Part Six 1947-1953

INTEGRITY OF THE GRID

20. The Post War Crisis
21. The Raver Objectives
22. Engineering for Quality
23. Integrity of the Grid



20. THE POST WAR CRISIS

If we are to achieve a better life for all, the natural resources of the country must be regarded as a public trust.

–Harry S Truman
State of the Union Message
January 4, 1950

The post war period, 1947-1953, brought major adjustments in United States international relations, reexamination of internal domestic affairs, rebalancing of political leadership, and a series of crises for the Bonneville Power Administration as it was caught up in some of the larger national issues.

Despite the high hopes engendered by establishment of the United Nations in 1945, the international scene deteriorated into the Cold War. This led to the Truman Doctrine and aid for Turkey and Greece in 1947, USSR control of Czechoslovakia in 1948, the Marshall Plan of 1948 and the foreign aid program, the Soviet blockade of West Berlin in 1948 and 1949, the Berlin airlift, the North Atlantic Treaty Organization (NATO) in 1949, and the Korean conflict in 1950.

Americans reacted to the wartime restrictions and continued shortages of consumer goods and housing, rent control, inflation, and the wave of labor strikes in 1946. Even before the November election, Congress began to move into the vacuum created by the death of Roosevelt in April 1945. Congress asserted itself to gain a greater voice in managing Federal agencies through two acts.

The Administrative Procedure Act of 1945 required Federal agencies to notify the public of proposed major decisions, provide opportunity for comment, and public hearings, and the possibility of court review. The Government Corporation Control Act of 1946 stripped the President of authority to create government corporations, reserving it instead for Congress. The Act permitted review of Federal proprietary agencies to determine whether they should come under the Act. The Secretary of the Interior elected not to have the Act apply to BPA.

During the war, President Roosevelt had listed full employment as a post-war goal. A bill to accomplish this was watered down before it became the Employment Act of 1946. Among other things, it created the Council of Economic Advisors and required the President to provide Congress with an economic report annually.

The 80th Congress. The November 1946 election climaxed the 10-year slide in Democratic majorities. The 80th Congress had 245 Republicans to 188 Democrats in

The Hungry Horse Dam serves as a symbol of BPA progress in the early post-war period. It became the third dam in the system. It represented upstream storage for downstream benefits, and it was the focal point for the fight to achieve hydraulic and electrical integration.

the House and 51 Republicans to 45 Democrats in the Senate.

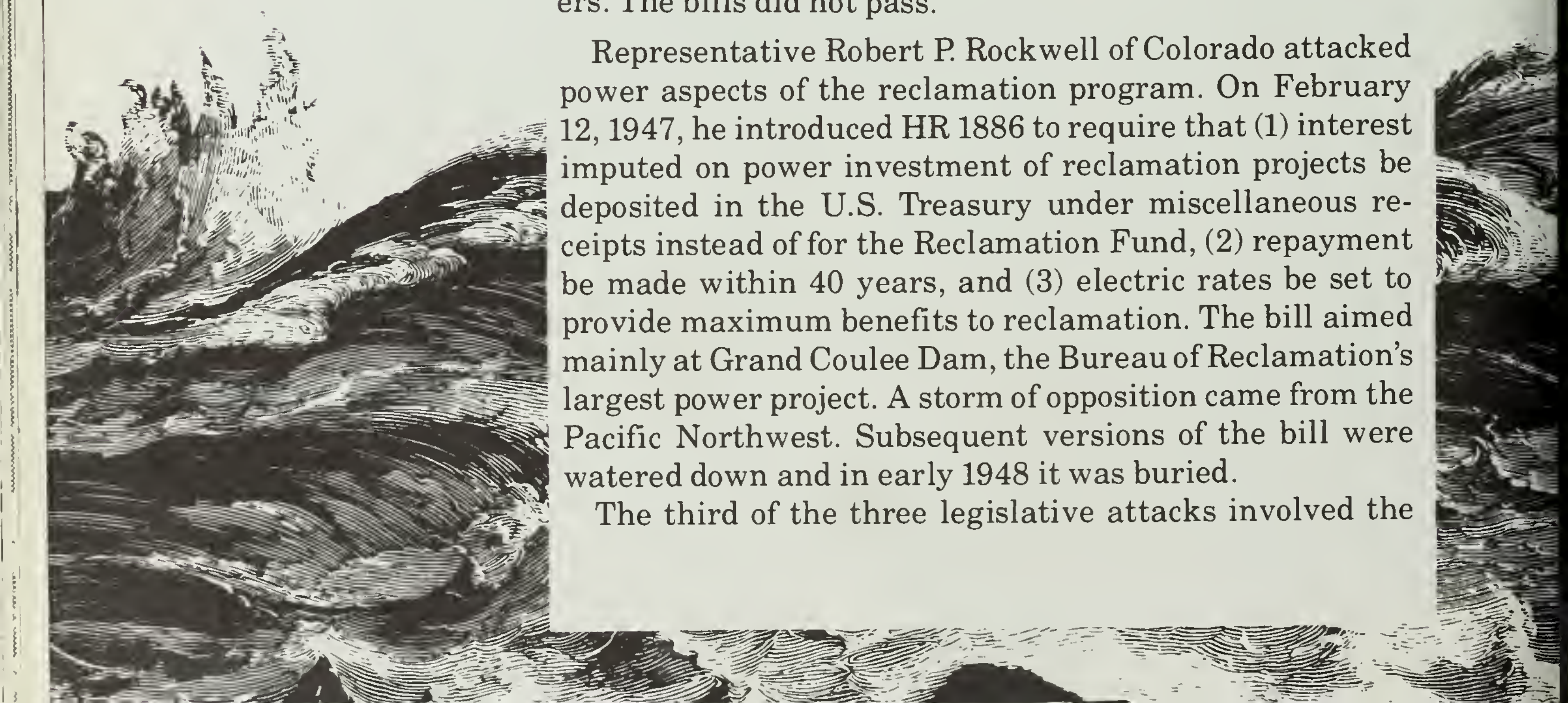
Henry M. (Scoop) Jackson, then a three-term Congressman, was one of the few Northwest Democrats elected or relected to the Congress in 1946. Many times he helped carry the torch for BPA in the House Appropriations Committee before moving to the U.S. Senate in 1952. In that year he again bucked a national trend, being one of four Democrats to unseat Republican senators despite the Eisenhower landslide. The others were John F. Kennedy of Massachusetts, Stuart Symington of Missouri, and Mike Mansfield of Montana. The latter succeeded Lyndon Johnson in 1961 as Majority Leader of the United States Senate. Senator Jackson was assigned to the Senate Interior and Insular Affairs Committee, rising to chairmanship of the Committee which is now the Senate Committee on Energy and Natural Resources. Jackson was first elected to Congress in 1940, four years after Magnuson. The two Washington Senators have thus served in the Congress for virtually the entire existence of BPA.

The new Congress overrode President Harry S Truman's veto and enacted the Taft-Hartley Act in an effort to curb labor unions. On the other hand Congress generally supported construction to extend rural electrification. The Pace Act of 1944 had liberalized the REA Act.

The Federal power program was a focal point of the 80th Congress. Attacks came on a number of fronts. The House Committee on Foreign and Interstate Commerce held hearings in mid-1947 on two bills to reduce FPC jurisdiction over private electric utilities. Representative William J. Miller of Connecticut had introduced HR 2972, to restrict FPC jurisdiction to regulating only actual interstate sales of electricity, and HR 2973, to limit FPC's hydroelectric licensing authority to cover only major navigable rivers. The bills did not pass.

Representative Robert P. Rockwell of Colorado attacked power aspects of the reclamation program. On February 12, 1947, he introduced HR 1886 to require that (1) interest imputed on power investment of reclamation projects be deposited in the U.S. Treasury under miscellaneous receipts instead of for the Reclamation Fund, (2) repayment be made within 40 years, and (3) electric rates be set to provide maximum benefits to reclamation. The bill aimed mainly at Grand Coulee Dam, the Bureau of Reclamation's largest power project. A storm of opposition came from the Pacific Northwest. Subsequent versions of the bill were watered down and in early 1948 it was buried.

The third of the three legislative attacks involved the



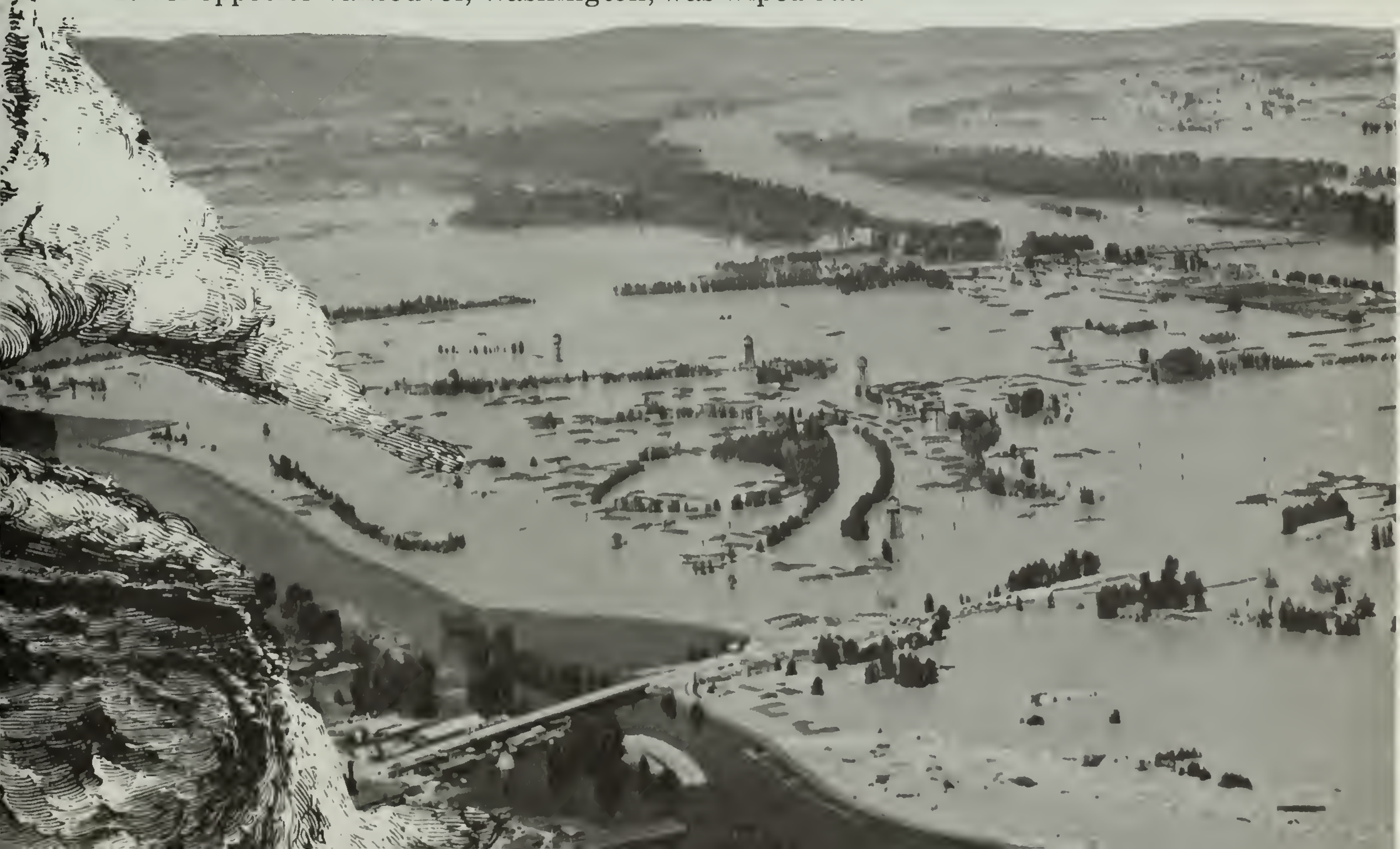
efforts of Congressman George A. Dondero of Michigan to repeal Section 5 of the Flood Control Act of 1944. His HR 3036 would have required the Corps of Engineers to sell power from its hydroelectric dams outside the BPA area at the bus bar. The bill languished after extensive hearings but Dondero continued his attacks with speeches and a final thrust in an article, "Wanted: A New Federal Power Policy," in the Public Utilities Fortnightly of September 8, 1948.

The most telling attack on BPA came from the House Appropriations Committee. Led by Representative Ben Jensen of Iowa, the House Sub-committee in 1947 drastically slashed the BPA budget request. The Committee Report stated it deplored the Washington State PUDs' "un-American practice" of condemning private electric utility distribution systems.

The Pacific Northwest delegation in Congress and newspaper editors rallied to BPA's support. Congress raised BPA's operating and maintenance and construction budgets for fiscal year 1949. Congress also reacted to the disastrous May 30, 1948, Columbia River flood by increasing appropriations for Columbia River dams.

The third largest Columbia River flood in recent history reached peak flow of 1,010,000 cfs at The Dalles on May 30, 1948. The Memorial Day flood throughout the region resulted in 38 deaths, destroyed 5,000 homes and left 35,000 homeless, forced evacuation of 100,000, flooded 251,000 acres, breached 13 levees, and caused $103 million in damage. Oregon's second largest city, Vanport, on the Columbia River opposite Vancouver, Washington, was wiped out.

Flood control became an added motivation and purpose of Columbia River development as the result of the Memorial Day flood of 1948. It started the drive that led to building Libby, Dworshak and the Columbia River Treaty projects for both power and flood control.



Truman Comes Back. As November 1948 approached, the New York Times and nearly all other predictors, predicted a Dewey victory. The vote gave Truman a plurality of 24.2 million to 22 million for Dewey. The electoral vote was Truman 303, Dewey 189, Thurmond 39. The voters elected an 81st Congress with 263 Democrats to 171 Republicans in the House and 54 Democrats to 42 Republicans in the Senate.

The new Congress approved increased budgets for BPA and hydroelectric projects. The fiscal year 1950 budget allowed $4.18 million for operations and maintenance and $26.8 million for BPA construction. BPA received $5 million for operations and maintenance and $44.6 million for construction for fiscal year 1951.

The Truman Administration attempted to promote a Columbia Valley Authority in a special message to Congress. But CVA bills languished in favor of the River and Harbor and Flood Control Act of 1950.

The Corps of Engineers from 1943 to 1948 had conducted an extensive review of its 1932 Columbia River study. The Columbia River flood in 1948 sparked a further quick review to increase the emphasis on upstream storage for both flood control and power. The River and Harbor and Flood Control Act of May 17, 1950, authorized the Corps to construct a record number of new power projects — Albeni Falls, Libby, Priest Rapids, John Day, and The Dalles, and a number of small projects in the Willamette River Basin. It reconfirmed the 1946 authorization of Chief Joseph Dam. Possibly the threat of CVA helped pass the bill.

The 1950 election left the Democrats with slim majorities in the House and Senate. The Korean conflict underlined BPA's role in national defense, mainly that of increasing aluminum production. The fiscal year 1952 budget provided $5.6 million for operations and maintenance and a record $68 million for construction. The 1953 fiscal year budget added $6.6 million for operations and maintenance and $66.5 million for construction. These record budgets would not be exceeded until 1964.

The foregoing account emphasizes the national climate as it affected BPA. The situation within the Pacific Northwest can be reviewed against this backdrop.

Northwest Power Supply Falters. Washington State population increased from 1,736,191 in 1940 to 2,378,962 in 1950 and Oregon from 1,089,684 to 1,521,341. The end of the war occasioned the loss of many jobs, but most of the people stayed. Many veterans went to college. The housing boom provided work in the woods and sawmills. Some pulp mills were built. Irrigation opened new farm lands. The Hanford complex remained in full operation. The region experienced a semirecession but managed to get through the post-war adjustment without a deep depression.

The drop in BPA loads in aluminum potlines shut down after the war led to a major controversy — BPA load forecasts.

Administrator Raver believed it was a utility's duty to anticipate the electric load, and to "build ahead of the load." In October 1945 BPA urged that construction start immediately on McNary and Hungry Horse Dams.

Raver predicted early restoration of the aluminum load and that the pent-up residential demand would triple the load in a few years. In contradiction to this, large surpluses were predicted, even without Hungry Horse and McNary on line, in a joint memorandum issued January 4, 1946, by four private utility companies (WWP, PP&L, NWE Co., and PSP&L). The memo delayed the start of the McNary project.

The region suffered a peaking power shortage in late 1948. This was followed by shortages of both energy and peaking in 1951 and 1952. The shortages led to some name calling and attempts to place blame. BPA issued a post mortem memorandum February 20, 1953, entitled, "Remarks re Responsibility for Existing Power Shortage in the Pacific Northwest." But the region had come to an agreement on load forecasting long before that.

Raver made a major adjustment in 1946 when he encouraged formation of the Tacoma Conference, later called the Pacific Northwest Utilities Conference Committee (PNUCC). It was a forum to preview BPA budget proposals based on a regional electric load forecast. Member utilities testified as a group on areas of agreement – usually the need for more dams and "backbone" transmission. Two bones of contention remained (1) BPA's desire to include new industry, and (2) the desire of the public and cooperative systems to include customer service or feeder transmission lines. The PNUCC has served many times since 1946 as a clearinghouse on areas of agreement.

BPA modified its industrial sales policy in 1948 by requiring, where feasible, that industries served directly by BPA (direct-service industries) take a kilowatthour of interruptible power with every three kWh of firm power. During the Korean crisis, the Secretary of Interior authorized BPA to base its power sales for one year on a median year water condition assumption.

Despite these steps, BPA had considerable unsold and unused secondary energy, mainly in the summers. Studies showed that power shortages in California and the Pacific

Northwest in 1948 could have been avoided by exchanging power over a transmission intertie. Efforts from 1949 to 1953 to gain Congressional approval of an intertie failed. BPA's testimony in 1951 in favor of building steam-electric generating plants in the Pacific Northwest was also to no avail.

The post war period was characterized by considerable opposition to BPA and the entire Federal power program. Congressman Ben Jensen of Iowa used the Congressional Record to castigate Raver, notably on March 29 and 30, and April 13 and 19, 1949. While serving as chairman of the House subcommittee handling BPA appropriations, Representative Jensen had employed Robert E. Lee to investigate BPA. Lee visited BPA July 15-27, 1948, to examine the files. Lee reported to Jensen among other allegations that BPA was conducting a public power crusade against free enterprise. Raver denied the allegations. Generally he received support in Northwest newspapers, and from other members of Congress.

Raver was labeled a "socialist" in a Reader's Digest article in August 1950, ostensibly written by Leslie A. Miller, former Wyoming governor, entitled, "What Does CVA Mean to You?" In two conversations with Raver, Miller denied writing the libelous statements, alleging they had been inserted without his consent. Representative Henry M. Jackson of Washington and Senator Wayne Morse of Oregon defended Raver and charged the Reader's Digest with dishonest journalism.

Throughout World War II BPA had urged that construction start on new projects, mainly McNary and Hungry Horse Dams. As mentioned, authorization was granted in 1945 and 1950 for 10 large projects and several smaller ones.

Each year BPA issued a 6-year advance program specifying needed generation, but each year the schedule slipped. McNary and Hungry Horse were finally started in 1948. While only the Coulee generators went on line during the early post war period, BPA's persistent efforts finally resulted in 11 projects under construction by 1953. They were Hungry Horse, Albeni Falls, McNary, Detroit, Big Cliff, Lookout Point, Dexter, Chandler, Chief Joseph, Palisades, and The Dalles.

Despite some reverses and sniping, Raver made it through the post war crisis. Other chapters will treat in more detail some of the ideas for which he laid the foundation.

21. THE RAVER OBJECTIVES

The fundamental objective of the Bonneville Power Administration is to encourage the use of power from Federal multiple-purpose projects as a tool for conservation and development of resources.

–Paul J. Raver
Our Objectives 1950

The second Bonneville Power Administrator had the double advantage of arriving early on the scene, following Ross' untimely death, and then serving more than 14 years, longest of any Administrator, indeed twice as long as anyone else. Dr. Raver got BPA through its organizational growing pains, through the war years, through the post war adjustment, and through the 1953 political transition. He continued during his eight years with Seattle City Light to provide public power leadership including service as President of the American Public Power Association in 1959.

Raver earned high marks for administrative leadership. At a time when few university graduate schools were teaching public administration, he was adopting many public administration principles, such as participative management, delegation of authority, and management by objectives.

He surrounded himself with strong top level staff, each a manager in his own right. His key officers were a "general staff." He acted not as a military general, but more like a university professor conducting a graduate school seminar. He might disagree with his Staff Advisory Council, later called the Executive Committee, but he would often bow to consensus and let that opinion prevail.

Raver believed in delegation and decentralization. He designated field officers, who became district managers and later area managers. Some area field offices were subdivided into district offices. Decentralization enhanced liaison with local electric systems, as some authority was transferred from BPA headquarters to area managers. This often met with skepticism and some resistance from the central staff.

The area manager system had dual purposes. First, the managers were valuable eyes and ears for Raver. Second, it provided internal checks and balances among central office division officers and area and district officers.

Having set the objectives and delegated authority downward and outward, Raver allowed his division officers and local managers to develop procedures to carry out the objectives.

Raver often would interrupt his public speeches by reaching in an inside coat pocket to extract a well-worn copy of the Bonneville Project Act. He would read a section, and ask his audience what they thought it meant. Then he would interpret it to illustrate a point. He referred to the Act as his orders from the Congress, his "marching orders." He abided by it and let his audiences share his duty to carry out the law.

This is evident in one of his first speeches as Administrator to the Portland City Club:

"Like the manager of any enterprise, I have rather specific instructions from my board of directors. The Congress of the United States has directed me to carry out certain policies. With these policies some of you may not agree. But they are the law of the land and their existence must be recognized."

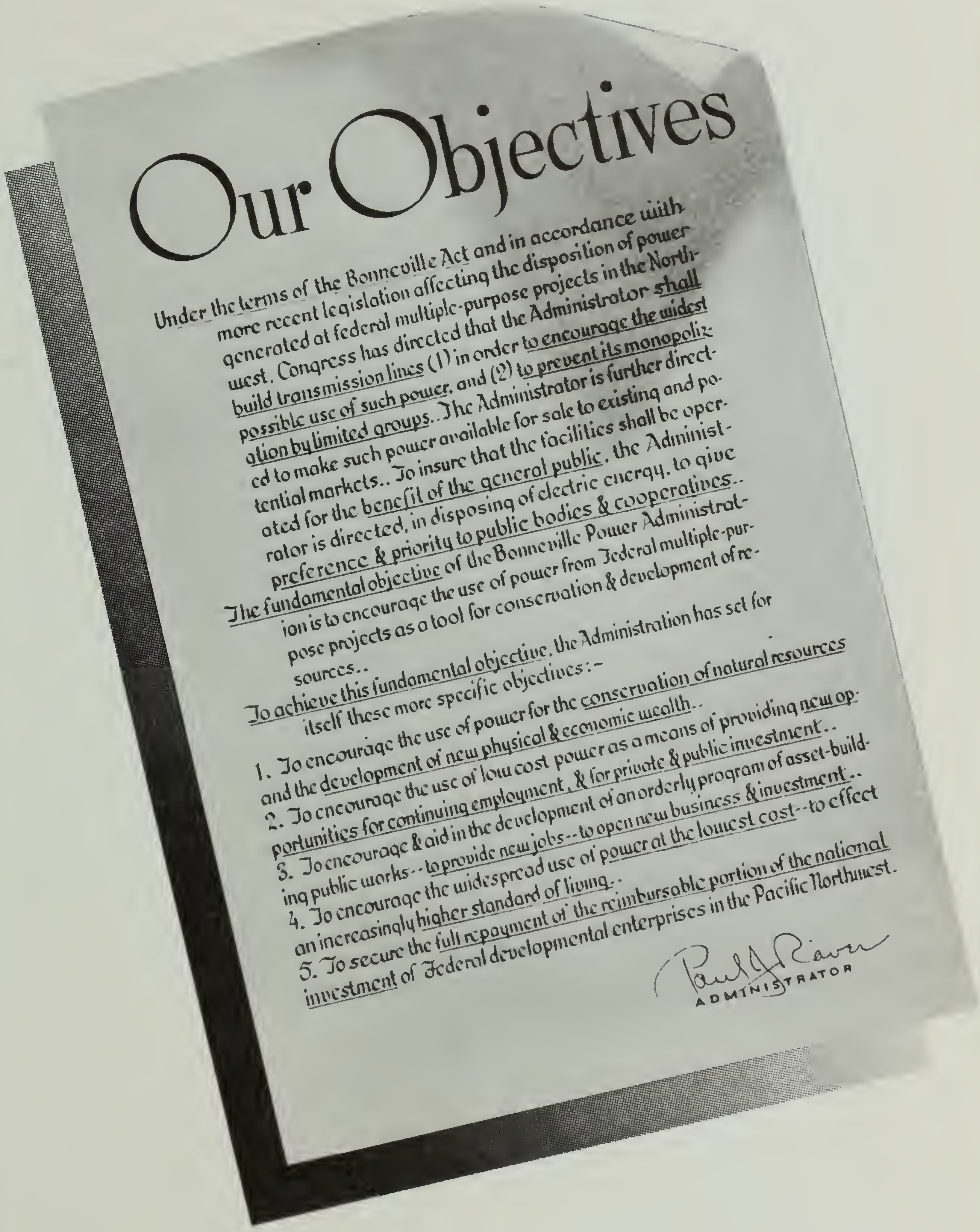
He then listed seven policies embodied in the Act, and added that the system should pay its own way and encourage economic development. He left the public versus private power issue in the hands of local people. He maintained that the big job was "making America's greatest river serve all her people."

Raver trimmed the major policy list to three by May 1940. They were to encourage widespread use, prevent monopoly, and insure preference to public and cooperative systems.

He broadened BPA objectives in a May 6, 1946, memorandum to the Columbia Basin Inter-Agency Committee, and used a similar version in a speech April 24, 1947, at the National Rural Electric Cooperative Association Convention. After slight changes they were published in the March 30, 1950, issue of the employee publication *BPA Currents,* and on 22 by 17 inch posters. They were posted in BPA offices, shops, and substations where they reminded every employee of BPA's mission. Although based on the Bonneville Act the wording also, in part, reflected Secretary Ickes' January 3, 1946, Memorandum on Power Policy, and included Raver's objectives for regional development, conservation of natural resources, and creation of job opportunities.

The Ickes 1946 policy statement included directives to help organize public and cooperative power systems:

"Active assistance, from the very beginning of the planning and authorization of a project, shall be given to the organization of public agencies and cooperatives for the distribution of power in each project area. The statutory objectives are not attained by merely waiting for a pre-



Our Objectives

Under the terms of the Bonneville Act and in accordance with more recent legislation affecting the disposition of power generated at federal multiple-purpose projects in the Northwest, Congress has directed that the Administrator shall build transmission lines (1) in order to encourage the widest possible use of such power, and (2) to prevent its monopolization by limited groups.. The Administrator is further directed to make such power available for sale to existing and potential markets.. To insure that the facilities shall be operated for the benefit of the general public, the Administrator is directed, in disposing of electric energy, to give preference & priority to public bodies & cooperatives..

The fundamental objective of the Bonneville Power Administration is to encourage the use of power from Federal multiple-purpose projects as a tool for conservation & development of resources..

To achieve this fundamental objective, the Administration has set for itself these more specific objectives:-

1. To encourage the use of power for the conservation of natural resources and the development of new physical & economic wealth..
2. To encourage the use of low cost power as a means of providing new opportunities for continuing employment, & for private & public investment..
3. To encourage & aid in the development of an orderly program of asset-building public works--to provide new jobs--to open new business & investment..
4. To encourage the widespread use of power at the lowest cost--to effect an increasingly higher standard of living..
5. To secure the full repayment of the reimbursable portion of the national investment of Federal developmental enterprises in the Pacific Northwest.

Paul J. Raver
ADMINISTRATOR

BPA Deputy Administrator Ray Foleen joined six former Portland Area Managers at an open house May 27, 1980. From left to right Warren Marple, William Trommershausen, Tom Black, Ray Foleen, John Alberthal, Jack O'Neal, and Bob Walters.

ferred customer to come forward and offer to purchase power."

Raver helped carry out this policy particularly in helping to electrify rural areas. Ickes resigned in 1946. Julius A. Krug served as Secretary until 1950 when Oscar L. Chapman became Secretary. The policy remained on the books until 1953.

Organization Management. To achieve the objectives, Raver instituted administrative orders that emphasized the organization structure. Administrative Order No. 12 of October 1939 established the Staff Advisory council. Number 18 early in 1940 changed the name from the Bonneville Project to Bonneville Power Administration.

The BPA personnel division prepared a 72-page *Power Policy and Program* in April 1941 which contained lectures for supervisory personnel by Raver and six of his top officers. They represent BPA's philosophy rationale as of that time.

The September 21, 1943, revision of Administrative Order No. 12 replaced the Staff Advisory Council with the Executive Committee. Four days later Raver established the Office of Executive Secretary serving the Executive Committee, Bonneville Advisory Board, and other advisory groups. For several years Roy Bessey, former director of PNWRPC, served as Executive Secretary and provided a strong sense of planning.

Many orders were consolidated in Administrative Order No. 59 of November 4, 1943, entitled General Organization. It included a new organization chart. Reorganization followed October 13, 1947 under a revision of No. 59.

Over a period of years BPA shifted from administrative orders to the BPA Manual. This reflected Reorganization Plan No. 3, effective May 24, 1950, which transferred all

authority within the Department of the Interior to the Secretary. The Secretary in turn delegated authority to his bureau heads, who passed some authority on to key officers. The Department also developed a manual but retained secretarial orders. Many later became part of the Departmental Manual.

Decentralization. Raver's establishment of a strong headquarters staff and organization was in part a response to the weak headquarters structure he inherited. As the geographic interest and scope of the BPA operation spread out away from Portland, the logic of field offices became apparent, first in the direction of Grand Coulee.

In the spring of 1940 he sent William Trommershausen to Yakima to establish a field office and to make load forecasts for rural electric cooperatives in eastern Washington and northern Idaho. The success of the operation coupled with Raver's keen interest in rural electrification led to a system of field offices.

Administrative Order No. 50 of September 1, 1940, established five district offices under district managers. Although they would be the Administrator's representatives, they would be supervised on technical matters by the respective central office division chiefs.

Raver often explained his philosophy for having decentralized field offices in terms of his Illinois experience. While serving with the Illinois Commerce Commission, as the public service commission was called, he had witnessed the collapse of the overly centralized Insull holding company empire. He attributed the collapse in part to the lack of public confidence in utility activities. As he explained, a person could drop into an office in central Illinois and could not get an answer to a question until the employee talked to Chicago. Thus Dr. Raver dramatized his interest in decentralization of authority and responsibility.

The interference of World War II brought rural electrification efforts to a virtual halt. The district managers went away for war service, and BPA focused on serving large defense loads. A revival took place in 1945 but suffered a setback with the severe budget cut of 1947. The rebuilding of the district offices resumed in 1948. By that time the Branch of Maintenance began to decentralize followed by the Branch of Operations.

In 1950 Raver foresaw a system of 20 dams and the need for a more integrated approach to field offices. After two years of studies, he approved a plan effective January 1952 for four area offices at Seattle, Eugene, Spokane, and Walla Walla. Three district offices increased the system to seven field offices. The Kalispell district reported to Spokane; Wenatchee to Seattle; and Vancouver to Eugene. From time to time adjustments followed. The area offices undertook not only the customer relations duties but also operation and maintenance, and more recently design and construction of 115,000 volt customer facilities. Some of the people who later assumed major responsibilities at BPA received their training in these field offices. Henry R. Richmond became Administrator, Hector J. Durocher became Assistant Administrator for Power Management, Jack O'Neal and George A. Tupper became Assistant Administrators for Operation and Maintenance. The field officers facilitated good relationships with Members of Congress. More importantly the area and district officers served as spokesmen for their customers and in presenting the customer needs to the headquarters office.

External Organizations. Raver invited 20 regional leaders chaired by Milton Hunt McGuire of McMinnville, Oregon, to meet with him in 1944 for a briefing session on BPA problems, followed by an executive session to obtain comments and advice. Thus began the Bonneville Regional Advisory Council (BRAC). For most of its 34 years BRAC served as an important sounding board and advisory and discussion group. A transcript was made of each meeting. BRAC was abolished in 1978.

As previously mentioned, Raver made good use of the statutory Bonneville Advisory Board, particularly in the 1943 quest for upstream storage. It was replaced in 1946 by the broader Columbia Basin Inter-Agency Committee (CBIAC), a Federal-State discussion group on regional development problems.The statutory Pacific Northwest River Basins Commission replaced it 20 years later.

Also in 1946 Raver encouraged establishment of the Tacoma Conference. It became the Pacific Northwest

Utilities Conference Committee, involving initially only the generating utilities but later became open to all public, private, and cooperative utilities. The purpose has been to review BPA budget proposals based on a regionwide load forecast. The group has testified on BPA budget and Corps of Engineers budgets since 1946, although not always unanimously.

Raver also initiated the periodic customer meetings. Annually, and often semiannually, BPA held group meetings with its customers in each of its service areas. They have been valuable for discussing proposed wholesale rate changes, customer service policies, and proposed facilities. BPA has also initiated specialized meetings on conservation and power supply. Most recently the public involvement program has become much broader, providing opportunity for both oral and written comment.

These groups illustrate Raver's penchant for the "group think." Each group served as a sounding board and helped identify BPA with the entire region. The sessions facilitated BPA communications with utilities, community leaders, and news media. They were forums to develop consensus or at least reduce areas of misunderstanding or disagreement. Each forum enabled Raver, as it has subsequent Administrators, to provide leadership and contact with people interested in the BPA program.

On occasion the meetings consisted of such extensive BPA briefings that no time remained for discussion, giving the impression comments were not always wanted. This was particularly true during the 1954-1960 period. Group meetings originated during the Raver era, however, have been retained as useful liaisons between BPA and the people.

Congressional Relations. Raver inherited the Washington, D.C. office established by Ross, which was an effective contact with Congress, with Alvey continuing to head it. Although the nature of the office has changed over the years, it continues as a contact point for Members of Congress from the Pacific Northwest, acts as the eyes and ears of the Administrator in the Capital, maintains close contact with the Secretary of Energy (formerly the Interior) staff, and otherwise facilitates correspondence and communications.

Raver initiated visits with Senators and Representatives from the Pacific Northwest either when they were in the region or by himself visiting their Washington, D.C. offices. Almost from the first BPA has tried to observe a bipartisan approach. More importantly, each Administrator has viewed Congress as the BPA board of directors.

Raver Moves to Seattle. J. D. Ross moved from Seattle City Light to BPA. Raver moved from BPA to Seattle.

In the late 1940s and early 1950s he cast aside his reticence to play the role of public utilities professor. In speeches, articles, testimony, and annual reports he urged the principles of public utility responsibility and the necessity for BPA to act as a regional public utility to take care of loads in excess of the generating capabilities of local utilities.

Consistent with this responsibility, he pointed out the advantages of integrating the regional power system hydraulically and electrically. In a 1951 speech at Missoula entitled "Integrity of the Grid System," he used Hungry Horse Dam as the test of the integrity of the system.

He believed in linking the Pacific Southwest to the Pacific Northwest with an intertie. He did not live long enough to see this concept become reality.

Finally, he believed in orderly planning. He exerted positive leadership in the Pacific Northwest for effective planning.

The November 1952 election began the windup of the Raver era. With the election of Dwight D. Eisenhower the Republicans won narrow leads in Congress, in the House, 221 to 213, and in the Senate, 48 to 47.

Senator Joseph McCarthy of Wisconsin made headlines in 1953 with his efforts to expose communists. BPA did not escape the "red witch hunt." Raver was embittered by the unfair charges made against several BPA employees but could do little.

Raver had a reasonably good personal relationship with new Secretary of the Interior Douglas McKay, dating back to when McKay was Governor of Oregon. Raver's relation with Under Secretary Ralph Tudor was not as compatible. Tudor had been a colonel in the Corps of Engineers at Portland years earlier. He insisted Raver be discharged.

Secretary McKay stood by Raver, who had asked to be retained into 1954 to qualify for a pension. But Tudor persisted. When the Mayor of Seattle asked Raver to become Seattle's light department superintendent, he accepted. He resigned as BPA Administrator January 14, 1954. He was still the superintendent when he died April 6, 1963 at the age of 68.

The philosophy, talents, and administrative style of the BPA Administrator constitute policy. As BPA Administrator, for over 14 years, Raver was innovative, energetic, and monumental. He was painstaking and thoughtful. He organized well and provided outstanding leadership. The mark of this great man is etched many ways in BPA.

22. ENGINEERING FOR QUALITY

Plato once called for philosopher kings. Today the greatest need in all the bewildered world is for philosopher engineers.

– Stuart Chase

A New Deal for America 1932

Many people refer to Thomas Alva Edison (1847-1931) as the "electrical wizard." They compare his electric light to the magic lamp of Aladdin of the Arabian Nights story. Edison turned away praise of his genius by defining genius as 2 percent inspiration and 98 percent perspiration. Yet in 60 years he patented over a thousand inventions, including the improved carbon filament electric light in 1879.

At the age of 22 Edison decided consciously to be an inventor, and almost as soon he learned that for inventors to eat, the inventions must be useful. Literally he believed that necessity is the mother of invention, and therefore he first studied the need. After he launched the primitive direct current power system of Pearl Street in New York City in 1882, he continued to invent and improve the components for the system. He founded manufacturing plants to produce the components and merged several in 1892 to form the General Electric Company. He arranged financing to enable his customers to buy his products, although in the first 30 years, until 1912, large industries had more generating capacity than did the utilities.

Insull, a former secretary to Edison, broadened the electric system idea in 1911 by building transmission lines as a grid system fed by one or more large, efficient, central generating stations. In 1912 the transmission grid system idea took hold nationwide and became the instrument for merging small isolated, local electric systems into large area or regional enterprises. The huge capital requirements led to a further step or concept of systemization, the holding company, which financed, controlled, and engineered many large operating utility companies, often in different states.

Considering 1912 as the electrical industry turning point for adoption of the basic transmission grid idea, it can be seen that by 1937 the transmission grid system concept was only 25 years old. It was still quite simple and limited to 230,000 volts as the super power voltage. This perspective of time bears mention here because BPA has now been in existence more than half of the time period since the advent of the electrical grid system idea.

This chapter concerns BPA contributions to electric power engineering with emphasis on the integrity of the grid. In the enormous stream of electrical progress BPA

ERICKSON AIR-CRANE

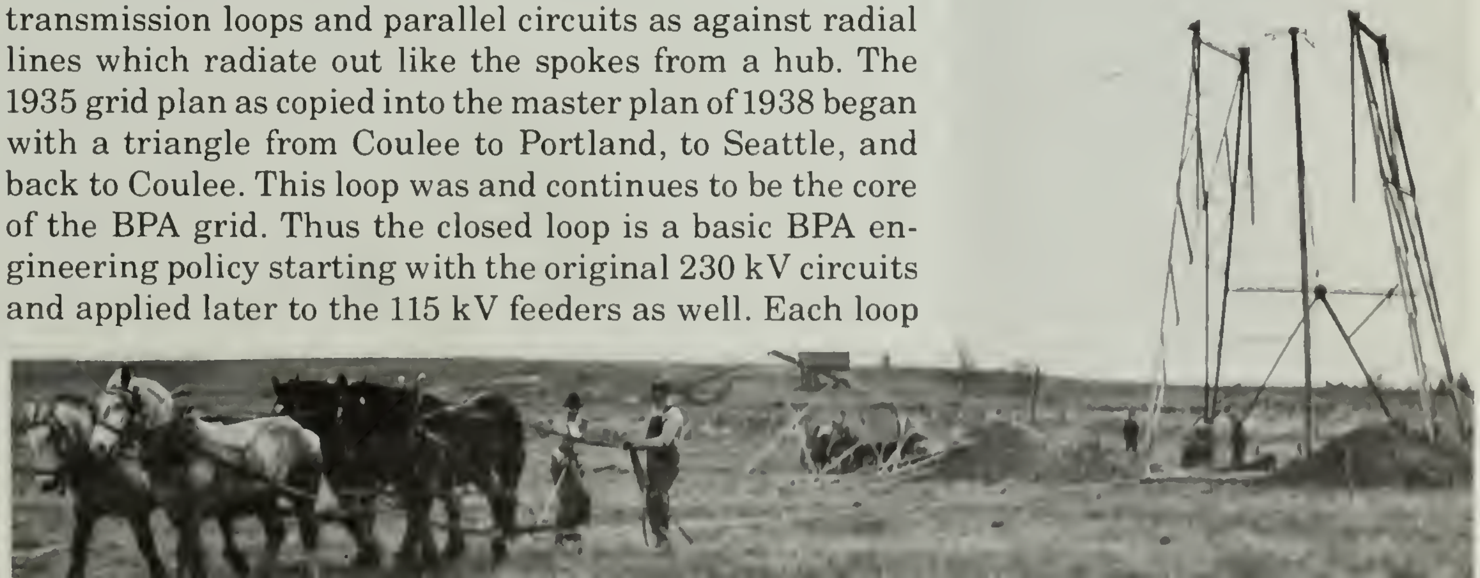
Old and new methods of building transmission lines. The horses and the ginpole have been replaced by helicopters, huge cranes, and sophisticated equipment for stringing conductor. The facing page features BPA's delta tower used for 500,000 volt lines.

has often been inventive but mainly it has improved the application of existing knowledge.

Much misunderstanding exists about the inventor and the date of the discovery of a new principle, theory, concept, or idea. So little is said about the enormous effort of making it work. Engineering is the art or science of making practical application of knowledge. In other words, the job of the engineer is to make the thing work. Often more than 90 percent of the total effort goes into further research, building models, searching for better materials, refining the design, developing manufacturing methods, establishing a marketing organization, and bringing the product to the point of commercial success. Edison didn't invent the incandescent light idea, rather, he made it work. In many respects he was an engineer and pioneer industrialist.

Making It Work. As a matter of geographic necessity BPA had to focus on transmitting electricity from the water power generating plants, often in a remote mountain canyon, to deliver the energy to the point of use. With generation mainly east of the Cascade Mountains and the larger loads to the west, BPA had to focus on the difficulties of building and operating heavy duty transmission through the very few available mountain passes; passes subject to severe climatic conditions of snow, ice, wind loading, and treacherous terrain. Many of the lessons had to be learned the hard way, by experience.

BPA adopted very early a high reliability policy of closed transmission loops and parallel circuits as against radial lines which radiate out like the spokes from a hub. The 1935 grid plan as copied into the master plan of 1938 began with a triangle from Coulee to Portland, to Seattle, and back to Coulee. This loop was and continues to be the core of the BPA grid. Thus the closed loop is a basic BPA engineering policy starting with the original 230 kV circuits and applied later to the 115 kV feeders as well. Each loop



gives a customer a two-way feed as compared with a single feed from a radial line.

By 1952 BPA engineers had accumulated 15 years of experience, had visited many other large electric systems, and had purchased the products of many vendors and manufacturing companies. BPA had also developed a substantial number of electric transmission line construction contractors.

That year, in testifying on the budget for fiscal year 1953, BPA presented to the House Appropriations Committee a list of engineering accomplishments and an estimate of at least $12 million per year in savings resulting therefrom. Half of the savings resulted from the development of large transformers and use of autotransformers for $3 million each in annual savings. The list included:

Light steel towers
Reduced insulation
Large circuit breakers
Fast reclosers
Selective use of ground wires
Shunt capacitors
Series capacitors
Microwave technology
Lightning arresters
Vibration dampers
Cables
Potential transformers
Specialized hardware.

Testimony on the Senate side April 21, 1952, also included savings due to operation, maintenance, and management improvements.

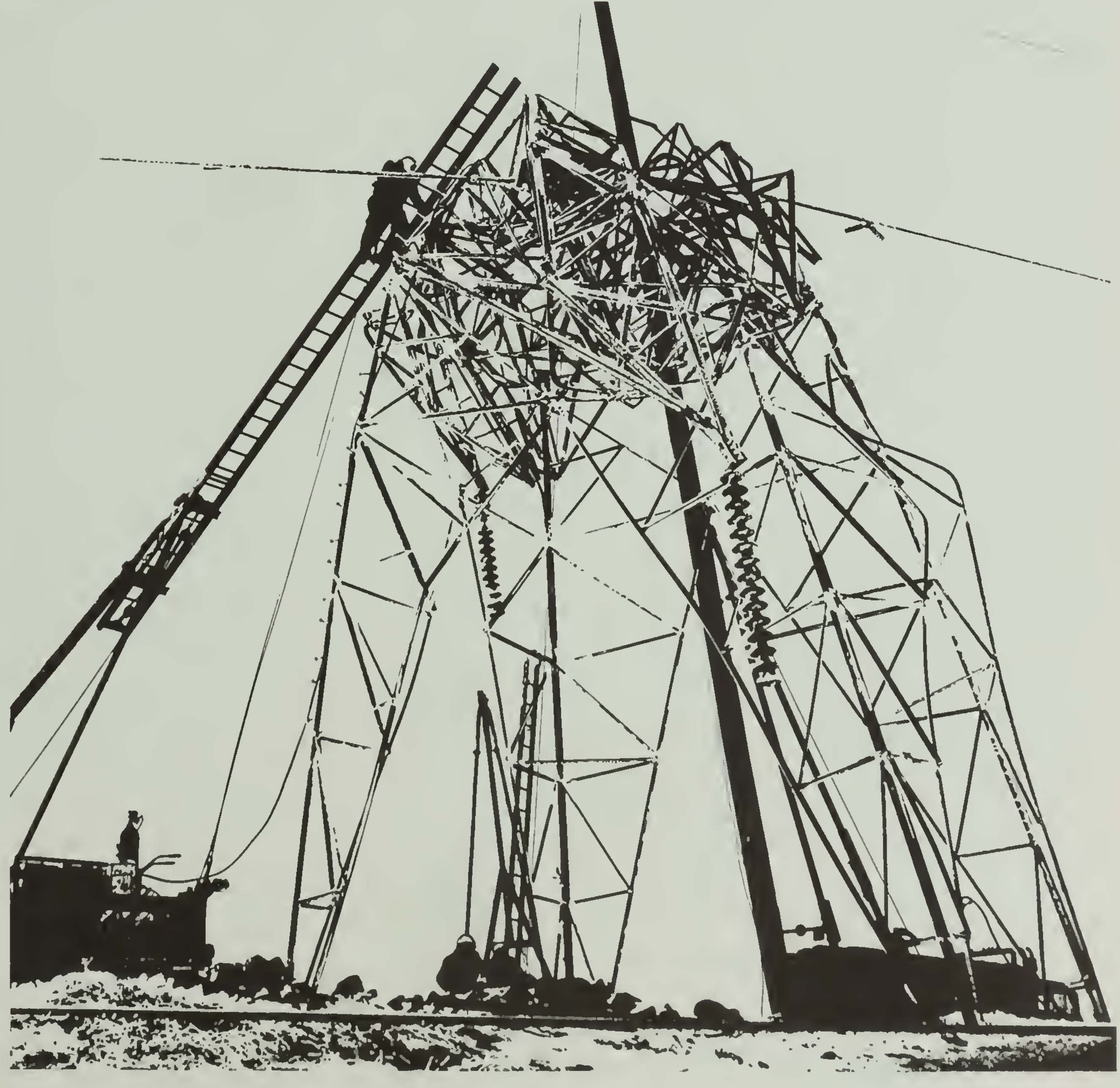
One does not lightly undertake to tell General Electric Company and Westinghouse and other well established firms to produce a bigger and better product. When a huge 230,000 volt transformer fails, the companies can easily attribute the fault to many non-manufacturing causes. BPA spent many years in refining and tightening its specifications. Time and again it went into meetings to improve the standards of the National Electrical Manufacturers Association (NEMA), the self-protection organization of the manufacturers. Moreover the companies, with some justification, were proud of their performance records – until greater challenges had to be met. BPA often undertook the burden of proof.

BPA pushed for higher voltages, greater capacity, less weight, faster acting protection systems, greater reliability, and insisted on the companies standing behind their products. Often other large utilities joined in the resistance to change. Often BPA imported new ideas from other countries, such as the large air circuit breakers from Germany and direct current technology from Sweden.

The Bonneville grid underwent a number of severe tests. The War provided an early challenge of crash construction to meet defense deadlines. The 1948 Columbia river flood caused some damage but mainly gave BPA an opportunity to help stricken utilities to restore service. The 1949 earthquake resulted in some design changes, mainly in substations. A freak wind storm toppled 13 steel towers of the McNary-Santiam line in 1960.

The Columbus Day storm of 1962, with winds gusting over 120 miles an hour, battered most electric and telephone utilities. Two BPA Columbia River crossing towers crumpled. Damage totaled $1.2 million. Each test challenged BPA engineers to build better. On the whole the system stood the tests and vindicated the quality of BPA engineering.

Light steel towers are easier and cheaper to build. Avalanches and wind gusts result in some loss, and these are replaced with heavier towers or relocated to safer areas.



Snow and earth slides in Cascade Mountain passes from time to time required rerouting of power. San Juan Islands cable failures resulted in prolonged outages and necessitated importation of diesel engines. In 1974 several BPA towers were dynamited in a bizarre attempt at blackmail. Every year many insulators are damaged by rifle fire. Outages also occurred as a result of human errors. Generally rerouting of power maintained service continuity.

BPA has made hundreds of engineering studies. Each proposed transmission line has undergone detailed analysis. In the early years a simple network analyzer took the place of hand computation. Today highly sophisticated computers rapidly print out the analysis. Regional power flow studies project ahead twenty years. Every point of delivery receives periodic review to determine when more capacity must be built.

The communications requirements of the grid and interties has resulted in an extensive microwave system. Communication circuits are used to gather data very rapidly and to control unmanned substations.

In recent years BPA has redoubled its efforts to insure the attractiveness of its facilities by means of landscaping, unobtrusive location of lines, and botanical control of transmission line rights-of-way. The engineering division has prepared an environmental impact statement on the proposed construction program each year since 1970. The major BPA contribution toward a better environment resulted from the replacement of hundreds of miles of lower voltage lines with high voltage, heavy duty circuits. This provides the needed increase in transmission capacity while optimizing the use of land. Currently BPA is studying utility corridors especially for critical mountain passes.

Research. BPA policy on research has had its ups and downs. Administrator Ross obtained a $500,000 appropriation to study direct current, a continuation of his long standing interest in d.c. He contracted with Eugene C. Starr of Oregon State College in 1939 to make the study. The Starr report, endorsed by the Consulting Engineering Board on September 11, 1941, recommended: for distances over 325 miles, continue to investigate d.c. and support research on suitable d.c. terminal equipment; and for distances of 125 to 300 miles use 230 kV plus series capacitors at transmission midpoints. This resulted initially in a 15,000 kVA experimental series capacitor bank at Chehalis in 1949. The Starr report, which BPA Chief Engineer Sol Schultz described as a "classic," explored other ideas which BPA adopted over the years including use of shunt capacitors in substations, reducing insulation levels, use of larger conductors, increasing voltages above 230 kV, and use of faster circuit breakers. The study suggested that the two 230 kV Bonneville-Coulee lines could carry as much as three lines by using series compensation at a cost one-fourth that of the third line. Starr served as chief engineer from 1954 to 1961 and later became a full-time consultant to BPA, a position he continues to hold.

Later efforts to obtain appropriations for research were not always successful. The high voltage test center at Ross had to be bootlegged for testing rather than research. The philosophy shifted toward asking the large manufacturing companies to research, develop, and test higher voltage and faster acting equipment.

During the 1960's both an a-c test center and a d-c test center were authorized with emphasis on developing hardware to reduce corona losses and reduce radio interference.

More recently BPA established its 1,200,000 volt a-c test lines at Lyons and Moro, Oregon, and 500 kV gas insulated pipeline for underground power transmission at Ellensburg, Washington. BPA now also participates in the research program of the Electric Power Research Institute (EPRI), an industrywide program. BPA is studying wind generation, geothermal power, low head hydro, cogeneration and many other technologies, including electric vehicles and several methods of improving energy conservation.

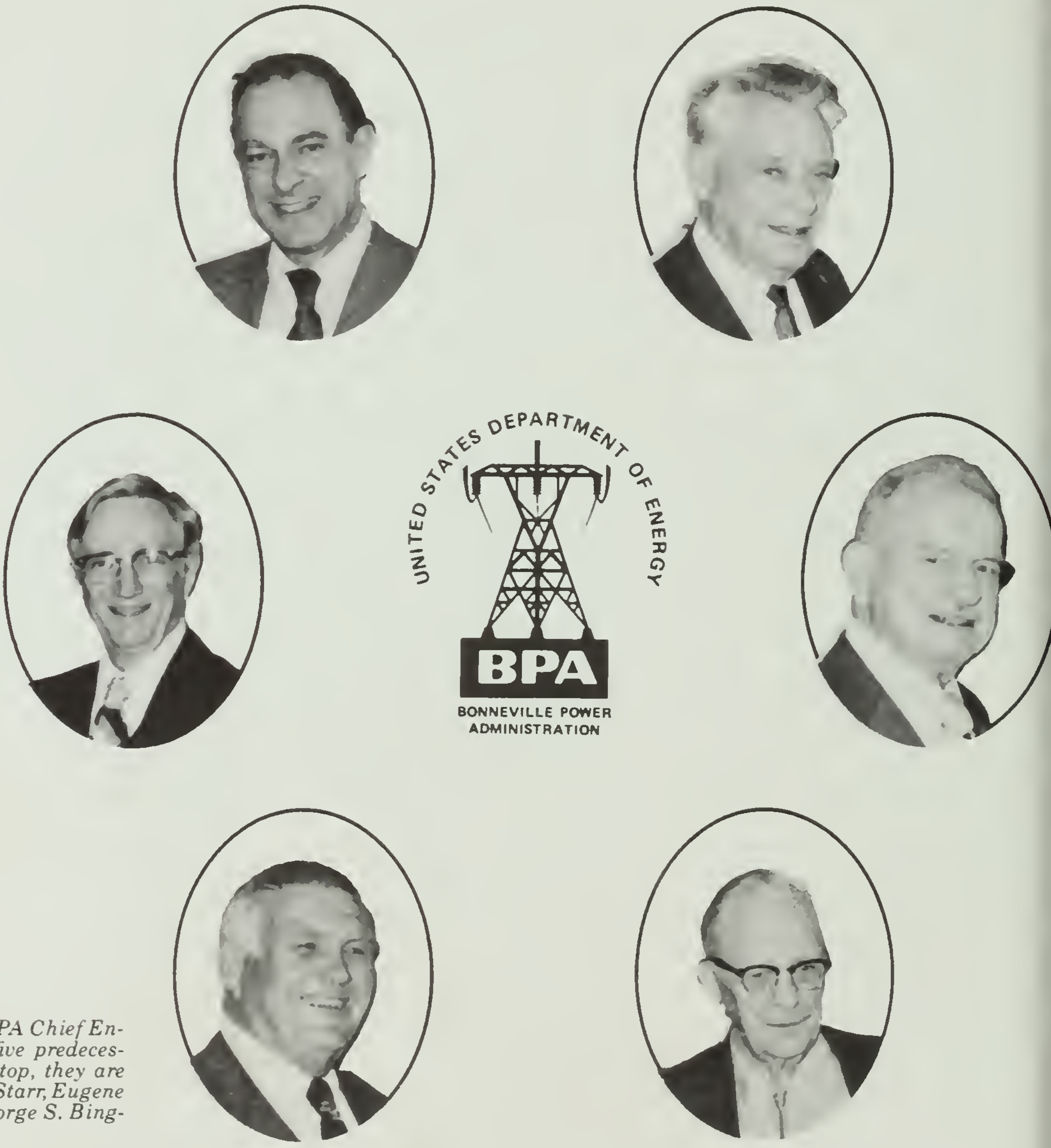
BPA receives many visitors and exchanges visits with many large electric systems. Recruiters visit most large West Coast universities and many throughout the nation to recruit graduating engineers.

BPA has been fortunate in having had a distinguished series of chief engineers. Charles E. Carey began, although J. D. Ross regarded himself as chief engineer. Sol E. Schultz served 1939-1954, followed by Eugene C. Starr 1954-1961, Eugene White 1961-1965, Kenneth Klein 1965-1970, George S. Bingham 1970-1977, Ralph S. Gens 1977-1980, and Marvin Klinger presently acting.

Engineering refers to more than electrical engineering. BPA also has civil, mechanical, and electronic engineers and many other kinds of professional people. Many engineers also serve in administration, construction, operations, maintenance, research, standards, reliability studies, specifications, inspection, and contract administration. In a sense engineering at BPA is generic and refers to the professional organization as a whole.

Engineering at BPA has become a general term which encompasses the expected characteristics of a good engineer such as intellectual honesty, and the broad range of pragmatic skills and judgment on economics and esthetics as well as utility, reliability, safety, reparability, management, and the human qualities.

The history of BPA engineering is the story of the development of one of the world's largest electric transmission grid systems and the sophisticated means for its efficient and effective performance. The engineers made it work. In making it work they provided the bridge for getting the benefits of Columbia River development to the people of the Pacific Northwest and the Nation.


UNITED STATES DEPARTMENT OF ENERGY
BPA
BONNEVILLE POWER ADMINISTRATION

A 1977 picture collected BPA Chief Engineer Ralph Gens and five predecessors. Clockwise from the top, they are Sol E. Schultz, Eugene C. Starr, Eugene White, Kenneth Klein, George S. Bingham, and Ralph S. Gens.

23. INTEGRITY OF THE GRID

...affected with a public interest...

–Lord Chief Justice, Sir Mathew Hale
De Portibus Maris, treatise on
public utility responsibility
1671-1676

In the decade from 1943 to 1953, Raver synthesized his thinking in three major areas: (1) securing upstream storage to achieve hydraulic integration of the Federal Columbia River Power System, (2) rounding out the transmission grid to achieve electrical integration, and (3) enunciating the region's public utility responsibility goal. These represented his concept of the "Integrity of the Grid," as he titled a September 1951 speech in Missoula. He defined "integrity" to encompass quantitative results of hydraulic and electrical integration and qualitative use of the grid in the public interest, as expressed in the policies of the Bonneville Project Act and the tests of public utility responsibility.

Upstream Storage. The traditional approach to water power development of a river involved installation of stream gauges by the U.S. Geological Survey (USGS) to determine minimum natural flow as the basis for hydroelectric planning. This assumed harnessing only the minimum flow. Consequently, early USGS estimates of the nation's water power potential were very conservative.

On that basis the 36,000 cfs (cubic feet per second) natural Columbia River minimum flow recorded December 1937 justified only three Bonneville generators. With some pondage plus Coulee storage the Corps designed for six units of 43,000 kW each. FPC Chairman Frank McNinch recommended two changes after the first two generators were ordered: extend the powerhouse to 10 units and increase the other 8 units to 54,000 kW. This was done by relocating a partially built fish ladder. By 1984 the second Bonneville powerhouse will double the capacity.

Several premises stood in the way of upstream storage. Pessimistic electric load forecasts assumed 15 years to load Bonneville's 6 units, and Coulee power would go begging. Second, the Columbia's vast potential would take care of the long-term future by means of low-head, run-of-the-river dams. Third, navigation on the lower Columbia provided the main focus, hence 1932 planning virtually ignored storage on upstream tributaries. Fourth, the Corps 308 report of 1932 said floods were no problem that could not be handled locally with dikes.

Major John S. Butler of the Corps Seattle office, in reporting on the upper Columbia portion of the 1932 report, called for comprehensive planning including storage projects like Hungry Horse for both flood control and power.

A second visionary approach to upstream storage appeared February 13, 1937, as a 63-page mimeographed study "Where Rolls the Columbia" by Ben E. Torpen, hydroelectric engineer of the Corps. Like Butler he found little sympathy. Torpen felt 125 million acre-feet of usable storage would be desirable, of which 67 million appeared reasonably feasible. He suggested 10 million acre-feet on the Kootenay Lakes, 10 million on the Arrow Lakes, and 10 million by building Grand Coulee to a 1345 foot elevation instead of the 1289 level. Professor Carl Magnusson of the University of Washington had also suggested that Grand Coulee Dam be made higher.

Conversely, the Bureau of Reclamation had to search for upstream storage as a means to capture flood waters for irrigation, as illustrated by Hoover Dam on the Colorado River and other storage dams throughout the Western States.

The search for upstream storage resumed in 1943 with the War Production Board's inquiry on how to increase Pacific Northwest power supply rapidly with minimum use of critical materials. The Corps and BPA proposed raising Flathead Lake 17 feet. The quickly organized Flathead Citizens Committee buried the proposal, and instead persuaded Congress to authorize the Hungry Horse Project. The Act of June 5, 1944, directed the Bureau of Reclamation to build "a storage reservoir of the maximum usable and feasible capacity."

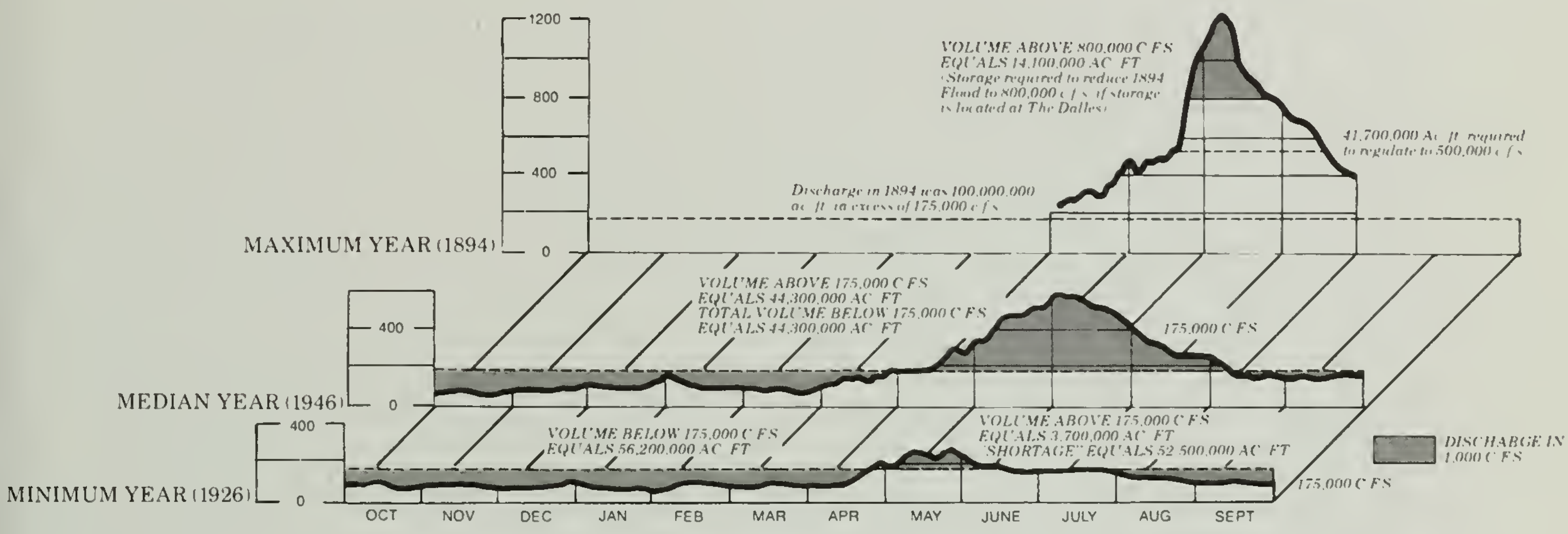
Optimum use studies surprised even project advocates. About three-fourths of the 1,230,000 kW of prime power benefits would occur at downstream dams, greatly enhancing the feasibility of downstream projects.

Historically, the Columbia River's record flows measured at The Dalles have ranged from 1,240,000 cfs at the peak of the June 1894 flood to a low flow of 36,000 cfs in December 1937. This is an erratic ratio of 34 to 1.

Seventy-three percent of the normal, natural flow occurs in the six summer months and 27 percent in the winter months when power needs are greatest. In contrast to the Columbia's 34 to 1 extreme flow range, that of the St. Lawrence River never has exceeded 2 to 1 due to the natural upstream storage of the five Great Lakes.

Ben Torpen of the Corps of Engineers reported December 12, 1952, to the Columbia Basin Inter-Agency Committee that half the hydroelectric potential of the Columbia River

HYDROGRAPHS OF THE COLUMBIA RIVER



RELATION OF STORAGE TO
FLOOD CONTROL AND REGULATED FLOW
COLUMBIA RIVER AT THE DALLES

and its tributaries would depend on building upstream storage projects.

As a result of Torpen's studies and the impetus provided by the disastrous Columbia River flood in the summer of 1948, the Corps revised its 308 report the following October to reflect substantial amounts of upstream storage. It projected that the storage could cut the 1894 record flow by one-third and ultimately in half, and, as a corollary, increase the low flow to about 125,000 cfs. This would reduce the erratic ratio to a regulated 4 or 5 to 1.

This goal has been achieved due in large part to the projects approved in the Columbia River Treaty of January 17, 1961, between the United States and Canada. However, many upstream storage sites are available for possible future development.

Electrical Integration. Hungry Horse Dam authorization assumed hydraulic integration would be achieved by filling the reservoir in summer and releasing water in winter. To accomplish such integration the generators must be idle much of the summer. This prompted an electrical integration proposal to build lines to transmit power from Grand Coulee Dam to Montana in summer, and power from Hungry Horse westward in the winter, notably during peak demand periods.

BPA's proposal to build lines to Hungry Horse was opposed by private utilities and led to a confrontation in the United States Senate in August 1949.

Typically BPA budget requests during the post-war years and well into the 1960s were severely cut by the House and reinstated with additions by the Senate where Magnuson served on the Appropriations Committee. A Conference Committee usually approved appropriations close to those specified by the Senate. Strategically, controversy was avoided in the House in order that the House would not be on record as opposed to some item and thus tie the hands of House conferees. When the item went back to the Conference Committee with Senate approval, often backed by a specific record vote, Senate conferees were obligated to support it. An item rarely would survive in conference if either the House or Senate had voted it down.

The two-year honeymoon resulting from the election of relatively strong Democratic majorities in the House and Senate in 1948 ended with the 1950 election. This reduced the House majority to 234 Democrats and 199 Republicans, and the Senate majority to 49 Democrats and 47 Republicans. Power budgets, especially for dams, were severely cut in 1951 and 1952.

Meanwhile, BPA had made its move in 1949. After a crucial and extended debate August 15-25, 1949, the Senate approved BPA's 230,000 volt Kerr-Anaconda line on a 45 to 35 vote. It was part of the system which integrated Hungry Horse Dam electrically into the BPA system. It led to BPA signing contracts in April 1950 for The Montana Power Company to transfer BPA power to cooperatives in western Montana.

An important ingredient of BPA's 1949 Senate victory was the implementation of the Hungry Horse Act provision for special preference to Montana. The Act states "beneficial uses primarily in the State of Montana but also in downstream areas..." Administrator Raver agreed to commit all the at-site portion of Hungry Horse prime power to Montana. This resulted in power contracts for two industrial plants in Montana and a block of up to 50,000 kW to The Montana Power Company.

Public Utility Responsibility. Repeatedly, in his last five years as Administrator (1948-1953), Raver reverted to his former role as a teacher of public utility responsibility. Under common law, a public utility has four responsibilities:

—serve all who come — of the type and in the area it was proposed to serve;

—render adequate service;

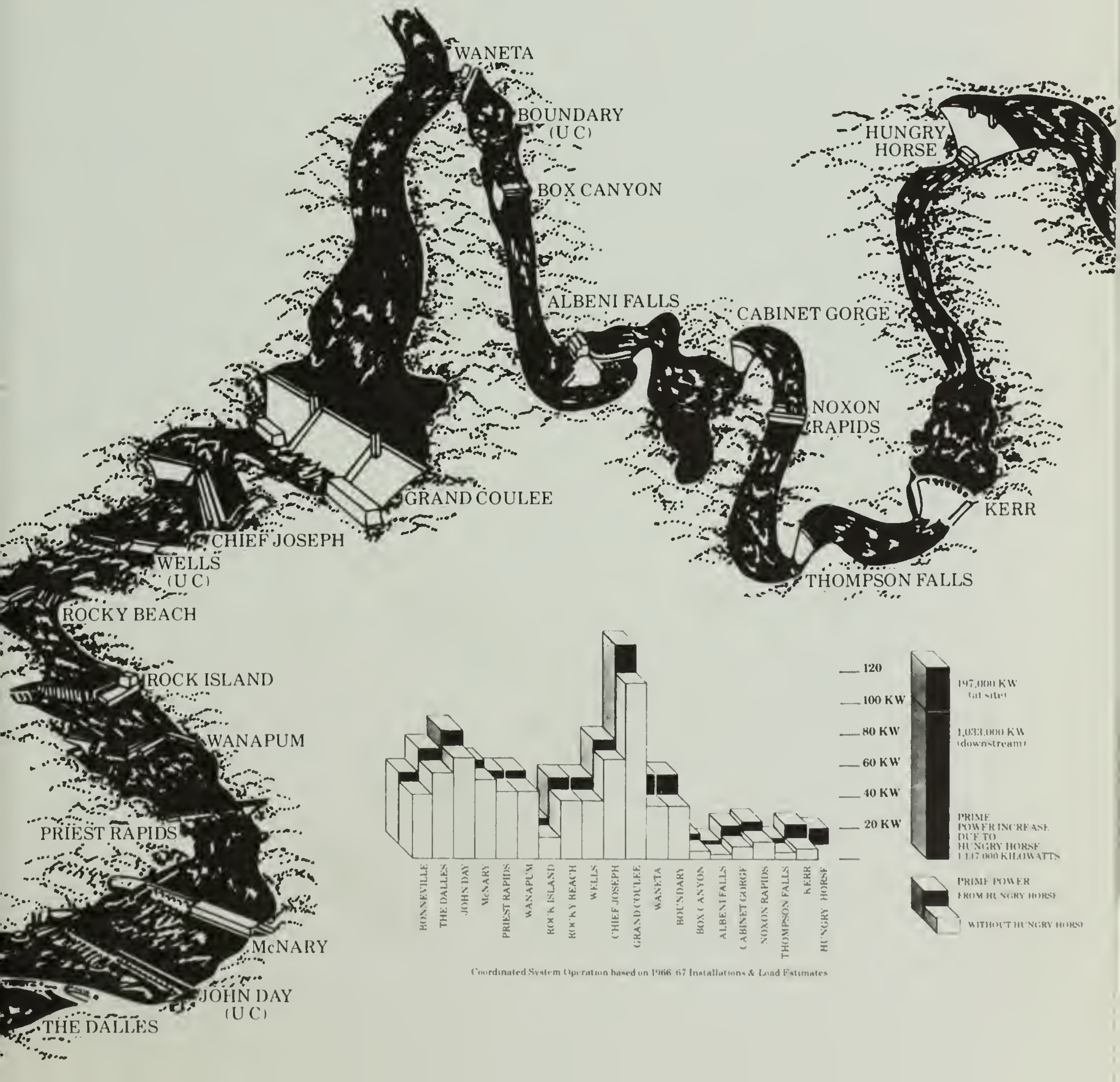
—serve at reasonable rates; and,

—serve without discrimination.

Public utility responsibility was enunciated as common law over 300 years ago by Lord Chief Justice, Sir Mathew Hale (1609-1676) of England in *De Portibus Maris* (concerning ports of the sea). He held that private wharfs under monopoly ownership "are affected with a public interest, and they cease to be juris *privati* only;" hence, such wharfs required licensing and public regulation in the common interest (1 Harg. Law Tracts, 78).

The principle became a part of American law when the Supreme Court anchored its decision in Munn v. Illinois (94 U.S. 113, (1876)) on Lord Hale's essay. This decision was the foundation for public regulation of private utilities in the United States.

DOWNSTREAM POWER BENEFITS
OF THE HUNGRY HORSE PROJECT



Coordinated System Operation based on 1966-67 Installations & Load Estimates

Congress created the first major regulatory commission in 1887, the Interstate Commerce Commission, to regulate interstate railroads and waterways. In 1907 Wisconsin and New York pioneered establishment of state utility regulatory commissions, a pattern since followed by almost all states. As Governor of New York between 1928 and 1932, Franklin D. Roosevelt led the move to strengthen utility regulation in that state. In a Presidential campaign speech in 1932 in Portland, he cited Lord Hale in calling for better nationwide regulation of electric utility corporations.

As electricity evolved from a luxury for few to a necessity, the electric power business became recognized as a public utility. Congress declared electricity "is affected with a public interest" in 1935 and authorized the FPC to regulate interstate electric transmission.

In enacting the Bonneville Project Act, Congress approved a number of public interest policy clauses which imposed on BPA certain public utility responsibilities. These included "widespread use" and "lowest possible cost" objectives, preference to public and cooperative agencies and rural and domestic consumers, prevention of monopoly and discrimination, the directive to build transmission lines, and authority to exchange power. Raver's advocacy

Encrusted with snow and ice the transmission lines normally continue to operate to insure continuity of service to the public.

of public utility responsibility, however, envisioned serving all of the unmet power needs of the region, something that has not yet been accepted by the Congress.

BPA was originated as a wholesale power marketing entity. Congress has added to BPA's duties and public utility characteristics since 1937 by extending the power marketing authority from one project to 30, broadening and defining BPA's service area, authorizing some long-term purchase of power through net billing, directing BPA to wheel non-Federal power, and authorizing BPA to issue revenue bonds to finance construction of transmission facilities. But BPA could not build generating plants and basically did not have a legal public utility responsibility.

The events of 1947 and 1948 accentuated and solidified public awareness of the importance of an adequate power supply, and BPA's role in providing it. In mid-1947, the 80th Congress cut back on appropriations for Pacific Northwest dams and lines. The Columbia River flood of May 30, 1948, left 38 dead and property losses in excess of $103 million. Six months later, a power shortage caused by low water conditions forced Christmas lighting to be extinguished and industrial power to be reduced. In his annual report December 1948, issued shortly after Harry Truman's reelection, Raver called for a public utility responsibility approach with emphasis on a more businesslike financing method:

> "With passage of the Bonneville Project Act in 1937, the Federal establishment assumed the responsibilities of a utility business. Lack of flexibility in Federal fiscal policies, which were designed primarily to fit the traditional government services, is now preventing fulfillment of this utility responsibility. Effects of this failure are cumulative. They will appear with increased intensity each year until remedial action is taken.
>
> "Such remedial action is within the purview of the Congress. If undertaken it should take these basic forms: (1) approval of a well planned program of Federal capital investment in the Columbia River, both immediate and long range; (2) approval of an adequate and sustained financing plan in support of such a program; (3) application of the modern management methods required by any solvent business enterprise, including provision for properly controlled use of revenues for operation and maintenance of the power system."

In 1950, Raver attributed the Federal Government's public utility responsibility to five economic facts: (1) the multiple-purpose aspect of Columbia River development,

(2) the necessity for integrating planning and operation of all projects in the Columbia River Basin, (3) regional dependence on virtually a single energy source, (4) the national defense interest in electroprocess industry, and (5) incidental to the first four, substantial preemption of Columbia River development by the Federal Government.

Raver's perception of the public utility responsibility concept molded the form of many of his speeches and was expressed in his last eight annual reports, 1946-1953. Raver often referred to public utility responsibility as shared. His leadership tack was particularly strong in the Bonneville Regional Advisory Council (BRAC). Dr. Wilson Compton, Washington State College president and BRAC member, said in a 1949 article on BPA's utility responsibility:

"In the Pacific Northwest the government-owned Grand Coulee and Bonneville Dams during the fiscal year 1947 generated 47.8 percent of the region's electric energy needs. During the past 10 years the United States Government has become the largest producer of power and in so doing has assumed the major responsibility for finishing the job."

The President's Water Resources Policy Commission reached a similar conclusion in 1950 in its 3-volume report:

"Where the Federal government assumes a major responsibility for power supply this should be recognized as a utility responsibility requiring the construction of new generating capacity (hydro or thermal) well in advance of expanding needs."

A BRAC research committee 1953 report recommended amending the Bonneville Act to enable BPA to purchase power and issue revenue bonds.

Secretary of the Interior Ickes had issued a memorandum in 1946 on Federal Power Policy which suggested a strong development policy, including Federal construction of steam generating plants to firm up hydro projects. Secretary Oscar Chapman replied in the affirmative in 1952 when questioned whether the Federal Government had accepted regional public utility responsibility (1958 hearings, p. 84). Secretary McKay reversed this view in 1953 in a revised Federal Power Policy:

"The Department does not assume that it has the exclusive right or responsibility for the construction of dams or the generation, transmission, and sales of electric energy in any area, basin, or region..." (USDI Memo, August 8, 1953).

In the 1961 Federal Power Policy revision, Secretary

Stewart L. Udall supported a shared responsibility:

"Utility systems of all kinds – Federal, state, municipal, private, cooperative – must carry out their full responsibilities to the public welfare." (USDI Memo, February 13, 1961)

In 1970 Interior Secretary Walter Hickel encouraged all utilities to cooperate, pointing out:

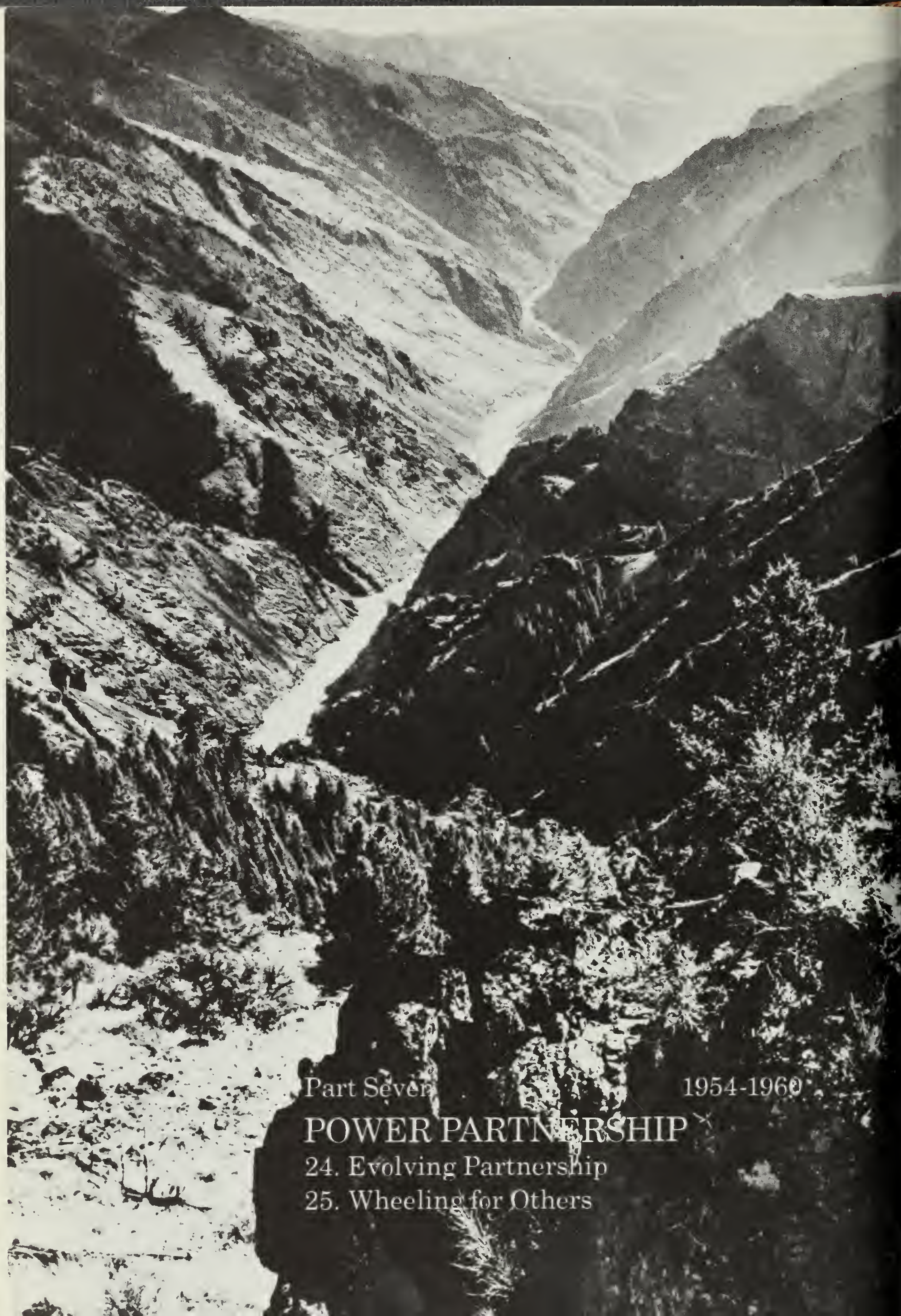
"The Department does not have the responsibility for supplying all the power needs of an area or a group of power users. That responsibility rests with nonfederal power suppliers in local areas." (USDI Memo, September 30, 1970)

For over 25 years the Interior Department has moved toward cooperation and shared responsibility.

While debate has seesawed through BPA's history, debaters generally have agreed that the need exists for an adequate regional power supply, but have failed to agree on how this need should be met. In the case of TVA, Congress in 1959 authorized issuance of revenue bonds to finance power facilities. Congress did not give TVA a legal public utility responsibility as such, but rather the means for achieving this responsibility. TVA Act amendments of 1959 read in part:

"It is declared to be the intent of this section to aid the Corporation in *discharging its responsibility for the advancement of the national defense and the physical, social and economic development of the area* in which it conducts its operations by providing it with adequate authority and administrative flexibility to obtain the necessary funds with which *to assure an ample supply of electric power* for such purposes by issuance of bonds and as otherwise provided herein, and this section shall be construed to effectuate such intent." (emphasis added)

By the close of his administration on January 14, 1954, Raver had substantially formulated the principles, policies, and programs for hydraulic and electrical integration and for the use of the Federal Columbia River Power System on a regionwide basis in the public interest. Technically, he did not persuade Congress to adopt the public utility responsibility concept, nor did Congress in the 1974 Act go as far for BPA as it did for TVA in the 1959 TVA amendments. But Raver laid the intellectual foundation which enabled BPA Administrators who succeeded him to move ahead, step by step, to define BPA's present role in the regional power supply picture. It illustrates the slow process of evolution toward what Raver called the "Integrity of the Grid System."



Part Seven 1954-1960

POWER PARTNERSHIP

24. Evolving Partnership
25. Wheeling for Others

24. EVOLVING PARTNERSHIP

The best natural resources program for America will not result from exclusive dependence on Federal bureaucracy. It will involve a partnership of the State and local communities, private citizens, and the Federal Government, all working together.

–Dwight D. Eisenhower
State of the Union Message
February 2, 1953

The pathway of history is strewn with the wreckage of human institutions unable to adjust to change. Born in a time of economic depression BPA adjusted well to the changing conditions of the war and post-war periods. How well would BPA adjust to a new political administration?

During BPA's first 15 years, 1937-1952, Democrats occupied the White House and controlled Congress every session except the 80th, 1947-48. In 1952 the people elected Dwight D. Eisenhower, and gave Republicans a slim edge in Congress: 221 to 213 in the House and 48 to 47 in the Senate. Among newly elected Democratic Senators bucking the Republican tide was Henry M. Jackson of Washington.

Electric power had not been a significant election issue. Or so it was thought.

In his first State of the Union Message, February 2, 1953, President Eisenhower announced a partnership policy for developing natural resources:

"Vitally important are the water and minerals, public lands and standing timber, forage and wildlife of this country. A fast-growing population will have vast future needs in these resources. We must more than match the substantial achievements in the half-century since President Theodore Roosevelt awakened the Nation to the problem of conservation.

"This calls for a strong Federal program in the field of resource development. Its major projects should be timed where possible to assist in leveling off peaks and valleys in our economic life. Soundly planned projects already initiated should be carried out. New ones will be planned for the future.

"*The best natural resources program for America will not result from exclusive dependence on Federal bureaucracy. It will involve a partnership of the State and local communities, private citizens, and the Federal Government, all working together.* This combined effort will advance the development of the great river valleys of our Nation *and the power that they can generate.* Likewise, *such a partner-*

America's deepest gorge, the Hells Canyon reach of the Snake River was the scene for an extensive public policy debate during the Eisenhower Administration.

ship can be effective in the expansion throughout the Nation of upstream storage; the sound use of public lands; the wise conservation of minerals; and sustained yield of our forests." (emphasis added).

This soon became the "power partnership policy" to encourage non-Federal development of hydroelectric power, a major Eisenhower Administration policy and 1953-1960 historical period theme. His opponents called it the "no-new-starts policy" and the "giveaway" policy. The partnership policy became a cause celebre in Congress and the 1954, 1956, and 1958 elections, particularly in the Pacific Northwest. It was mirrored in the 1960 election as John F. Kennedy campaigned to "get the country moving again."

Before tracing and analyzing the power partnership policy, other events that had some impact on BPA and Columbia River development should be noted. The Eisenhower period included two recessions 1953-4 and 1957-8. The first resulted in the election of a Democratic majority to Congress in 1954, and the second bolstered the Democrats' strength. Under the leadership of the "Texas titans"– Sam Rayburn, Speaker of the House, and Lyndon Johnson, Senate majority leader – Congress asserted its control over appropriations and managed to keep the Federal power program alive.

McCarthyism was rampant in 1953; however, Senator McCarthy was censured in a 67 to 22 Senate vote in 1954. McCarthy was defeated for reelection, and died in 1957.

Joseph Stalin, Premier of the Union of Soviet Socialist Republics, died March 3, 1953. His replacement, the more moderate Nikita Khrushchev, instituted a de-Stalinization policy. This provided an opportunity to de-escalate the cold war. Eisenhower invited Khrushchev to visit the United States to plan a summit conference. Hopes for a conference ended when the Russians shot down an American U-2 reconnaissance plane May 1, 1960, and captured pilot Gary Powers. The United States also continued to support Chiang Kai-shek while opposing the People's Republic of China. All this helped set the stage for the long U.S. involvement in Vietnam.

The U.S. Navy launched the nuclear submarine U.S.S. Nautilus in 1954, incidentally demonstrating the use of nuclear fuel to produce electric power.

The Supreme Court under Chief Justice Earl Warren ruled May 17, 1954, in Brown vs. Board of Education of Topeka, that "separate educational facilities are inherently unequal." This and succeeding civil rights decisions led to substantial changes in the Nation's social, intellectual, and political outlook.

Eisenhower's highway construction program vastly exceeded earlier public works programs. It still is a major program.

The USSR invited the world to watch the Sputnik outer space flight October 4, 1957, and soon others, including the dog in space November 3. The events stimulated the United States to increase Federal aid for education, with special emphasis on science instruction.

Population continued to increase and move westward during the 1950s. In that decade California gained 8 seats in the House, raising its total to 38. New York, Pennsylvania, and other eastern and mid-western states lost seats. Statehood for Alaska and Hawaii strengthened the block of Senators from west of the Mississippi to 46. This again changed the complexion of Congress.

History of Partnership. Eisenhower's power partnership policy to encourage non-Federal development of water power potential was not entirely new. It rested on the Federal Water Power Act of June 10, 1920. That Act asserted Federal jurisdiction over waterpower sites on navigable streams and Federal lands. It created the Federal Power Commission and authorized it to grant hydroelectric development licenses to any financially responsible applicant, with preference to states and their political subdivisions. The Act encouraged non-Federal development, primarily private development.

The arrival of the New Deal in 1933 had found private utilities in disarray, beset by financial problems as an aftermath of the collapse of utility holding companies. Construction of Boulder Dam stimulated national interest in large multipurpose water resource projects. The readiness of plans and urgent need for jobs and economic stimulus in 1933 led to construction of many Federal multipurpose hydroelectric projects, and development of the Federal power policy.

The Flood Control Act of 1936 was a milestone law for the Corps of Engineers. It established flood control as a national goal. This required the construction of many dams.

The private utilities did not quarrel with construction of some multiple-purpose Federal dams per se. Rather, they objected to public power systems and rural electric cooperatives being given preference for the projects' output transmitted over Federal lines. They also feared establishment of any more valley authorities like TVA. Non-Federal hydro development could short-circuit all these "problems."

By 1950 the private utilities were interested in building hydroelectric projects. That interest rose sharply on June 25, 1950, as the United States became involved in the Korean Conflict. The revised Internal Revenue Code spurred accelerated amortization or fast tax writeoffs for defense-oriented private investments. The newly established Defense Electric Power Administration (DEPA) granted numerous certificates of convenience and necessity for waterpower projects. They enabled companies to write off about 65 percent of project costs against corporate income taxes in 5 years. This strongly revived dam building by private utilities, beginning in 1951 and 1952. As a corollary, the Bureau of the Budget began to choke appropriations for Federal hydro projects. The Eisenhower Administration inherited this new focus on non-Federal development, added emphasis, and dramatized the trend by calling it the power partnership policy.

The eight volumes of the Public Papers of the Presidents for 1953 through 1960 amply record Eisenhower's views on the policy. It had strong support in 1953 and 1954 when Eisenhower had a Republican Congress. Support declined with each succeeding election.

After his February 2, 1953, State of the Union Message, Eisenhower responded to a question at his March 19 news conference on the Federal role in the Niagara and St. Lawrence power projects:

> "I just don't believe the Federal Government should be in these things except where it is clearly necessary for it to come in, and then it ought to come in as a partner and not as a dictator." (1953, p. 110).

At his May 14 news conference he favored the New York Power Authority building both projects. Congress approved legislation to that effect for St. Lawrence in 1954, and Niagara in 1957.

Meanwhile, Solicitor Clarence Davis wrote the FPC on May 5, 1953, to withdraw the Department of the Interior's 1952 petition of intervention in the Idaho Power Company's application for a license to build five small run-of-the-river dams on the Snake River. They were proposed as an alternative to the Federal Government building the proposed high Hells Canyon storage project, which would have had more than three million acre-feet of storage for power production and flood control.

Public power leaders reacted by forming the National Hells Canyon Association to plead the case for comprehensive development. The Company modified its five dam scheme to three, including a million acre-feet of storage at

Brownlee Dam. The Commission licensed the dams in 1955, but court review delayed construction several years.

Secretary of the Interior McKay announced a partnership transmission plan June 26, 1953. It called for BPA to end construction of its Redmond-Klamath Falls 230,000 volt line at Yamsay and sell its right-of-way and materials south of that point to the California-Oregon Power Company. In turn COPCO would transfer power over its facilities to BPA customers in southwestern Oregon.

President Eisenhower reiterated his power partnership policy in his July 31 Special Message on Natural Resources and his August 3 address to the Governors' Conference at Seattle. Secretary McKay issued a revision of the 1946 Ickes statement on Federal Power Policy on August 18, 1953:

"It is recognized that the primary responsibility for supplying power needs of an area rests with the people locally. The Department does not assume that it has the exclusive right or responsibility for the construction of dams or the generation, transmission, and sale of electric energy in any area, basin, or region."

McKay explained the new policy in a San Francisco speech August 21 and in many others during the next two years.

Assistant Secretary of the Interior Fred G. Aandahl, a former North Dakota Governor, made a major announcement September 29 at Fargo on marketing criteria for Bureau of Reclamation power sales in the Missouri River Basin. He maintained that low-cost Federal power had been a factor in the creation of public power systems. Then he revealed that the Department would try to eliminate disparities in retail rates for public and private utilities in order to end this alleged Federal pressure to create public power systems. Public power people branded the Aandahl criteria "the reversed yardstick."

He also announced that preference customers would have to be willing to receive power on a contract demand, take-or-pay basis, and that any power not purchased by preference customers at that time would be sold on equally long-term contracts to private utilities. Aandahl stressed:

"It is time that we get away from the idea of giving power away at the taxpayers' expense for the purpose of stimulating local public power and later its absorption by the Federal Government in an objective headed toward ultimate Federal Government monopoly of power."

Secretary McKay in 1953 approved BPA 20-year firm power sales contracts with Pacific Power & Light Company, Puget Sound Power & Light Company, Washington Water Power Company, California Pacific Utilities Company, Mountain States Power Company, and Portland General Electric Company. They expired in 1973 and were not renewed because BPA then foresaw shortages of energy to meet the load growth of its preference customers after 1983.

During his one year under the Eisenhower Administration in 1953, BPA Administrator Raver often referred to "an evolving partnership in utility responsibility in the Pacific Northwest." In his May 8 address at Spokane he told public and cooperative utility leaders that the region had developed its own partnership by means of the regionwide grid system, Northwest Power Pool, Pacific Northwest Utilities Conference Committee, Bonneville Regional Advisory Council, Columbia Basin Inter-Agency Committee, and voluntary associations and arrangements.

He again enunciated what he had said for years in his annual reports: the public utility responsibility for the Pacific Northwest's power supply was a "shared" responsibility and local systems would have to continue to assume a greater share of the responsibility. He placed a positive, constructive interpretation on the Eisenhower power partnership policy in terms of Pacific Northwest experience. Two later Secretaries of the Interior, Udall and Hickel, basically adopted the shared responsibility concept.

In his second year, Eisenhower delivered messages pertaining to the power partnership policy. His February 17, 1954, message urged amending the Atomic Energy Act to permit private ownership of nuclear materials and private manufacture of reactors. This was approved by Congress. He restated the power partnership policy in his dedication speech at McNary Dam on September 23.

In his January 12, 1954, address to the National Rural Electric Cooperative Association at Miami, Assistant Secretary Aandahl continued to interpret the Federal Power Policy of Ickes as aiming at "Federal monopoly of the electric power business." He continued to insist that only the Bonneville Project Act had a preference clause which required 5-years notice of intent to suspend service in contracts with private utilities. Actually the precedent was set in the TVA Act. Aandahl charged that the Bonneville withdrawal clause created an "exclusive right in perpetuity."

In an address May 5, 1954, to the American Public Power Association at Chicago, Under Secretary of the Interior

Ralph A. Tudor announced extension of the power partnership policy to multipurpose dams. The Federal Government would finance nonpower features and encourage non-Federal financing of powerhouse construction. A number of proposals soon appeared under this policy. They had considerable political impact.

Congress agreed to fund the flood control portion of the Markham Ferry project in Oklahoma and let the Grand River Dam Authority install the power facilities. This partnership precedent soon appeared in proposed legislation for several Pacific Northwest projects: Cougar Dam, Green Peter Dam, White Bridge, Bruces Eddy, and John Day Dam. All these partnership proposals died in Congress. All eventually were built as Federal projects.

The Tudor Period. A candid, inside view of the Eisenhower power partnership policy appears in the diary of Tudor who served as Under Secretary from March 31, 1953, to September 1, 1954. Published after his death in 1964 by his widow, his diary consisted of notes dictated every week or two and sent to the Tudor Engineering office staff in California.

Colonel Tudor graduated from the U.S. Military Academy at West Point in 1923. He was Corps of Engineers Portland District Engineer from May 5, 1943, to December 18, 1945. During that time, he represented the Corps on the Bonneville Advisory Board in lengthy meetings with BPA Administrator Raver.

His antipathy for Raver was apparent. As early as April 11, 1953, he had a replacement from Seattle in mind for Raver but could not persuade Secretary McKay to dismiss Raver because "he does have a rather personal liking for Dr. Raver..." Tudor also made clear he played the lead role in the Secretary's decision, with Cabinet approval, to withdraw as an intervenor in the Hells Canyon Dam issue. On May 10, 1953, Tudor explained:

"I note that the Democrats often refer to this as a 'give-away regime' and particularly refer to the Hells Canyon matter as a 'give-away.' Actually, I wish they would realize that what we are doing is taking these things away from the bureaucrats and giving them back to the people. If there was a 'give-away' program in existence in this country, it has been during the last twenty years when the regime here in Washington has been 'giving away' the assets of the country for the benefit of a few." (pg. 16)

Tudor often attended White House meetings and briefed the Cabinet on power issues. On August 29, 1953, he wrote of plans to order BPA to "confine their activities to the selling of power." On October 24 he reacted to public power requests that he be investigated and fired, explaining "The whole thing is that I do not believe in the nationalization of power..." (pg. 63).

Tudor had agreed to serve one year as Under Secretary. He agreed to extend his tour of duty to push the Interior Department's legislative program through Congress. In his first year he persuaded the Department to adopt the power partnership policy, a new Federal Power Policy, to scrap the high Hells Canyon Dam, and also to push for Raver's departure.

Congress had approved record construction budgets for BPA in mid-1951 and 1952 of $68 million and $66.5 million respectively. This led to an increase in BPA employment from 1,716 in 1948 to 3,360 in fiscal year 1952.

Congress approved a more modest $38.9 million construction budget in mid-1953, followed by $24.3 million in mid-1954. Raver anticipated the trend to reduce the budget by trimming the staff during fiscal year 1953 to 3,016 and in fiscal year 1954 to 2,707. The reduction was accomplished mainly by normal attrition and laying off construction workers as jobs were completed.

Despite this, the layoffs were of concern to Oregon Senator Guy Cordon of Oregon as he faced reelection in November 1954. As chairman of the Senate Appropriations Subcommittee handling the BPA budget, he had been assured there would be no further layoffs.

Tudor's diary for the summer of 1954 repeatedly refers to his desire to aid in the forthcoming election to increase the thin Republican majority in Congress, and his efforts to push legislation to provide a favorable election climate. Despite his sensitivity to the political situation, Tudor made a large political mistake when he ordered BPA to fire 600 people. The July 20 Oregonian headline read, "Bonneville Staff Cut to Hit 600." Senator Cordon's reelection campaign went into a tail spin. The election of Richard L. Neuberger to the Senate, with a margin of about 2,500 voters, provided the one vote shift that enabled the Democrats to organize the Senate.

The 1954 election represented a narrow defeat for the Republican Congress. The 84th Congress had Democratic majorities of 232 to 203 in the House and 48 to 47 in the Senate.

Partnership Continues. Eisenhower's second two years, 1955-56, began with a strong continuation of the power partnership policy.

The FPC issued a license July 27, 1955, to the Idaho Power Company for the Brownlee, Oxbow, and Hells Canyon projects and thus precluded construction of the high Hells Canyon Dam. Although the National Hells Canyon Association challenged the FPC decision in the courts, the Idaho Power Company eventually won.

Congress launched a number of investigations and hearings during 1955 to challenge what the Democrats in control viewed as the Eisenhower Administration's private power bias. The Senate Judiciary Committee held extensive hearings on the Dixon-Yates contract which would have adversely affected TVA. The contract was cancelled on grounds of a conflict of interest. Fast-tax-writeoffs for private utilities were repealed after hearings.

Eisenhower's popularity continued. The economy improved, partly due to the stimulus of the highway program and other public works such as the St. Lawrence Seaway and Power Project. Despite the no-new-starts policy for Federal hydroelectric projects, Congress approved appropriations to complete projects already under construction.

The main exception to Eisenhower's partnership policy was the Upper Colorado River Project. Eisenhower pushed the button October 15, 1956, to start construction of the key project, Glen Canyon Dam.

Partnership Falters. In the 1956 election Eisenhower ran even stronger than in 1952, with a popular vote of 35.6 million to 26 million for Stevenson and an electoral count of 457 to 73. Congress changed little, remaining nominally Democratic, 233 to 200 in the House, and 49 to 47 in the Senate.

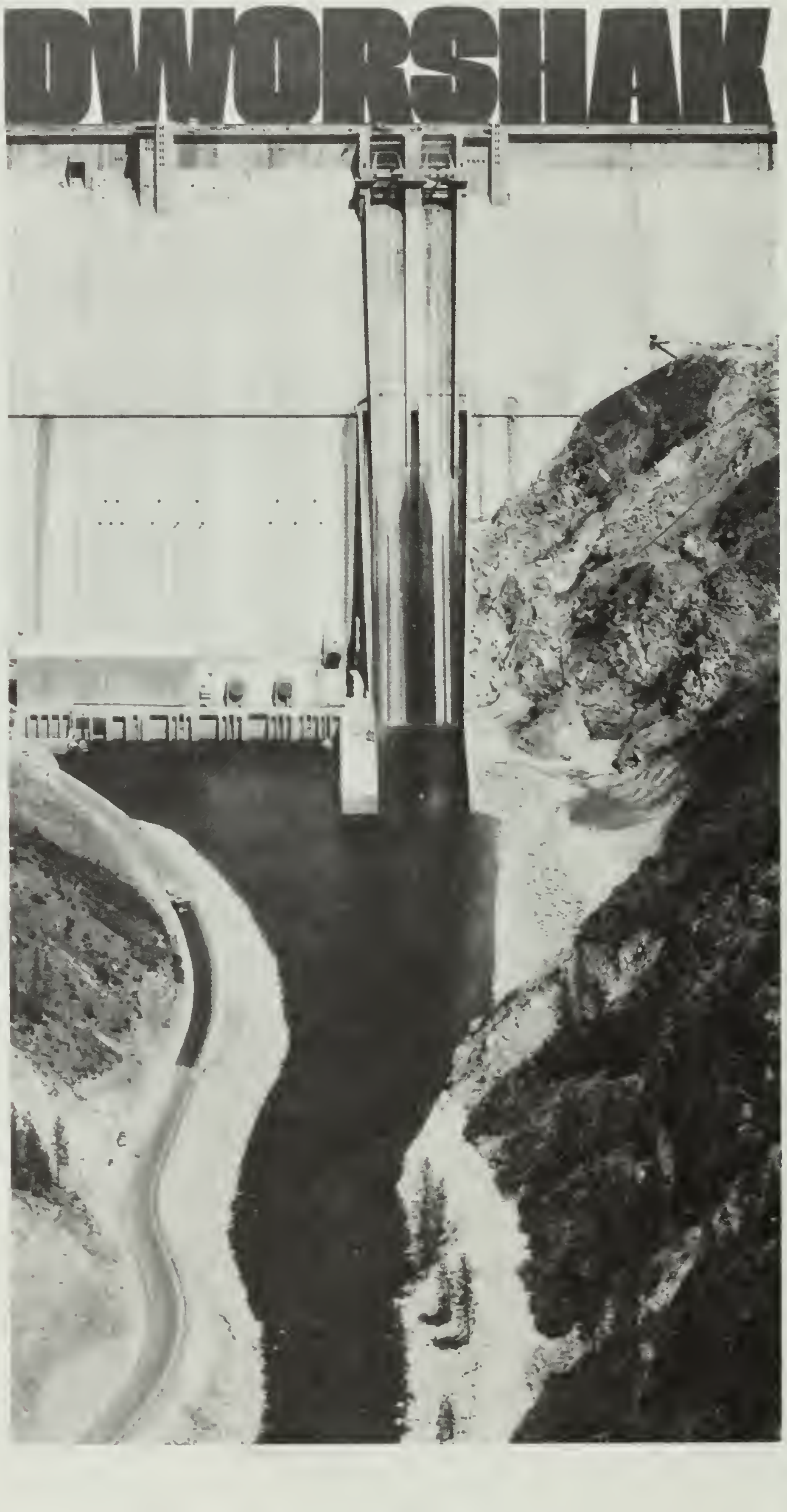
In the Pacific Northwest, however, the attempt to apply the power partnership policy at Federal dams went down to defeat. None of the dam partnership bills passed. The John Day proposal was a subject of debate between Representative Sam Coon of eastern Oregon and Senator Neuberger. Coon was defeated for reelection by Al Ullman, a Federal Hells Canyon Dam proposal supporter.

Hells Canyon and power partnership were issues in other races. Senator Warren G. Magnuson of Washington easily defeated the challenge of Governor Arthur B.

A partnership plan to build a private utility powerhouse at the proposed Federal John Day Dam was rejected. It is now the second largest Federal hydroelectric project in the region.

Langlie. Senator Morse defeated McKay who had resigned as Secretary of the Interior April 15, 1956. Fred A. Seaton of Nebraska became the new Secretary on June 9. He soft-pedaled power partnership.

Secretary Seaton provided a new climate at the Department of the Interior. An experienced newspaper publisher from Nebraska, he was well acquainted with public and



Dworshak Dam was completed as a Federal project, although once proposed as a partnership dam.

cooperative power since Nebraska is the only State served entirely by consumer-owned electric systems. During the Seaton period, BPA made significant gains through adoption of the wheeling policy in 1957, as discussed in the next chapter, negotiation of the Columbia River Treaty with Canada, postponement of action on the Pacific Gas and Electric Company offer to build a small California intertie, and postponement of a rate increase for BPA. Meanwhile the Congress continued appropriations for Pacific Northwest hydroelectric projects.

Economic recession dominated 1957-1958 and influenced the 1958 election. Sherman Adams, White House Chief of Staff, became involved in the vicuna coat scandal which prompted his departure September 22, 1958. Democrats swept the November election 283 to 153 in the House, 64 to 36 in the Senate, and held 35 governorships.

There was virtually no mention of power partnership during Eisenhower's last two years in the White House. He signed the TVA Amendments August 6, 1959, authorizing TVA to issue revenue bonds and directed it to "assure an adequate supply of electric power."

People in the Pacific Northwest likewise were interested in revenue bond financing for BPA. The Bonneville Regional Advisory Council endorsed the idea in 1952. The Northwest Public Power Association drafted a bill to enable BPA to use its revenues and issue revenue bonds. Senator Neuberger introduced the bill, with cosponsorship of other Northwest Senators, and held extensive hearings

Senator Henry M. Jackson, left, and Senator Warren G. Magnuson, right, both of Washington, discuss a bill for a proposed Bonneville Power Corporation with the author in 1958.

in 1958-1959. Meanwhile, Secretary Seaton recommended Department of the Interior power marketing agencies be authorized to set up revolving funds so they could use their own revenues. None of the proposals was accepted.

At the request of the Senate Interior and Insular Affairs Committee, the Department of the Interior conducted studies in 1959 and 1960 for a proposed high-voltage interconnection between the Pacific Northwest and California. The delays caused by the studies carried the issue over into 1961. Studies and negotiations with Canada resulted in the Columbia River Treaty. Also the Congress authorized the Hanford Production Reactor on a dual-purpose basis so that an electric generating plant could be added later.

Despite the Eisenhower no-new-starts policy, the Pacific Northwest added considerable hydroelectric generation. Congress wrote in the necessary appropriations. The Federal Columbia River Power System capacity (nameplate rating) increased from 2,462,400 kW June 30, 1952, to 6,033,250 kW June 30, 1960. BPA transmission expanded from 4,954 circuit-miles to 8,028. Non-Federal generation also increased sharply. Non-Federal generation reduced BPA power sales, and the existence of the power surplus and a soft aluminum market caused BPA revenues to level off. BPA began operating in the red in fiscal year 1958.

Historically, the Eisenhower era was a period of evolving partnership and a foundation on which policies and programs of the 1960s and 1970s would be built. Evolving partnership went full circle in the case of TVA. It began with some musing by President Eisenhower about selling TVA to private interests. Yet the 1959 law was tantamount to placing on TVA a full public utility responsibility for electric power supply. By contrast, Department of the Interior officials emphasized they did not have and did not seek a public utility responsibility for power supply, as stated by Secretary McKay on August 18, 1953.

The McKay team of Tudor, Aandahl, and Clarence Davis left little doubt about their favoritism toward private utilities. The written policy did not change under Seaton, but the conduct of the administration became more evenhanded.

The power policy extremes under Secretaries Ickes and McKay were moderated in the "shared responsibility" approach of Secretaries Seaton, and later Udall, and Hickel.

Finally, BPA learned how to meet the public interest test while adjusting after each election to the changing political climate and philosophy in the Federal administration and Congress. The wheeling policy was an excellent illustration.

25. WHEELING FOR OTHERS

The integrated power system has come to be recognized as the soundest basic mechanism for developing and for making available an adequate and economical power supply system.
–Philip Sporn

The man the Eisenhower Administration chose to implement the power partnership policy in the Pacific Northwest was Dr. William A. Pearl. He served as a bridge between the region and the Department of the Interior, but he identified mainly with the region.

He brought to the task a varied background in education, mechanical engineering, industry, and management. From 1947 to 1954 he was the Director of the Institute of Technology at Washington State University at Pullman, and in 1951-1952 served as Acting President at WSU. Some of his research was for BPA.

Born in Kent, Washington, October 2, 1893, he received the degree of Bachelor of Science from WSU in 1916 and the MS in 1926. In 1934 he received the Ph.D. from the University of Michigan. He taught at WSU, Benson Polytechnic School in Portland 1926-1932, part time at Illinois Institute of Technology, and in 1946 returned to WSU as the Chairman of the Mechanical Engineering Department. For 10 years he was with the Whiting Corporation of Chicago advancing from Chief Engineer of the stoker division to vice president in charge of manufacturing. He died April 5, 1975, in Phoenix, Arizona.

Dr. William A. Pearl

Every Administrator has his own management team, generally made up of long-established civil servants, and a few policy-oriented appointees usually recruited from outside BPA. The custom of naming top members of the BPA management team in the annual report evolved slowly. In the first BPA annual report of 1938 only one employee was named, Administrator Ross. The six names mentioned in 1948 included the four division officers. The 1949 report introduced a major change; including the branch chiefs, it reached 32 names. For 20 years the list averaged 45. The inclusion of all section heads in 1968 brought the list to its present 170 total. District managers were first named in 1949, and the revised area-district manager system was introduced in 1952.

One of the key members of Dr. Pearl's management team was J. Lane Morthland who served as Regional Solicitor and wrote two important legal opinions as the basis for BPA's wheeling policy. For the last half of the Pearl period, Morthland served as Assistant Administrator, replacing

Byron Price who became General Manager for the Eugene Water and Electric Board.

Perhaps the best summary of this period is provided in Dr. Pearl's December 15, 1960 letter transmitting his last annual report:

"Since January 1, 1953, installed generation in the Administration's marketing area has increased approximately two and one-half times. Roughly half of this unprecedented development was Federal and half non-Federal projects.

"There has probably never been a time in the history of the Pacific Northwest when we have faced a brighter outlook for the sound and continuing development of all aspects of our regional economy."

Congressional confirmation of BPA's authority to wheel power for others may represent the most important achievement of the Pearl Administration.

Wheeling service is the use of the transmission facilities of one system to transmit power of and for another system. On July 12, 1957, the Senate Committee on Appropriations declared:

"The committee recognizes the necessity for and the advantages of the pooling and wheeling of power in fulfillment of the interchange and interconnection requirements of the Bonneville Project Act, and as an incident to Bonneville's power sales arrangements with its generating – utility customers." (S. Report No. 509-85/1 on Public Works Appropriation Bill 1958)

Expansion of BPA's wheeling function was a major accomplishment of 1957, a policy evolution that began with the Bonneville Act of 1937 and has continued to the present. This chapter traces 40 years of policy formulation, identifies the considerations, and indicates how wheeling contributes to the integrity of the BPA grid system.

Early Wheeling. Wheeling requires existence of a transmission grid system and the owner's willingness to let others use it. Prior to 1937, many electrical pioneers had pointed out the merits of power pooling, or "giant power." In drawing his 1935 map of a grid system for the Pacific Northwest, Carey drew on the grid system experience of England, Ontario, and TVA. He likewise drew the master plan Ross included in the 1938 BPA annual report. In the 1939 annual report, Raver announced a policy of coordination with other public and private power systems:

"Under this method both parties to an interconnection maintain complete independence but agree to so schedule their operations that each may, without disadvantage to the other, obtain the maximum possible economic benefit from interconnection. Obvious benefits include:

(a) Reduction of reserve capacity, as either system may call on the other in time of emergency.

(b) Displacement of steam energy by surplus hydro energy preventing waste of water power.

(c) Exchange of surplus hydro energy where a diversity between hydraulic conditions produces a mutual firming up.

(d) Reduction in total generating capacity by taking advantage of any diversity that exists between system peak loads.

(e) Programming of generator installations to reduce the overbuilding factor on the combined load.

"These advantages can be obtained by coordination on a mutually agreeable and cooperative basis under which, as the various conditions arise, the two systems in accordance with a contractual understanding, work out the means of obtaining the natural economic benefit resulting from the interconnection. From time to time, the weight of economic advantage may swing from one system to another, but in the long run both systems save money and increase the reliability of their service. This is the type of integration which the Bonneville system has proposed to the four major municipal systems in Washington and Oregon."

Among objectives for the 230-kilovolt Bonneville-Grand Coulee line then being built were coordination of output from the two dams to realize more prime power, and interconnection of the Portland and Spokane load areas.

Raver was asked early in 1940 whether power could be transmitted over the Bonneville-Grand Coulee line to the Portland area for The Washington Water Power Company or Pacific Power & Light Company, if it were needed to meet demands that exceeded BPA resources. BPA General Counsel Alan Hart responded with a two-page opinion June 12, 1940, entitled "Transfer of Power for Private Companies." He pointed out that such transfers were not expressly authorized by the Bonneville Project Act, and transmission lines could be built only to transmit energy from Bonneville Dam and interchange energy with publicly owned projects. However, he justified the use of excess line capacity for transferring energy by noting that charges for transfers would help amortize line costs and thereby tend to reduce the cost of power from Bonneville. He reasoned that while such transfers would not constitute "mutual exchange of unused excess power" within section 5(b) of the Act, they would be permissible as quid pro quo.

"Transfer" to Hart meant what BPA now considers generally as two different functions, wheeling and transfer. The term "wheeling" came into use around 1950 to mean transmission of power for another party. It usually involves large utilities, major transmission facilities, and firm contracts for as long as 50 years. "Transfer" now generally means customer service transactions whereby a utility transmits BPA power to a BPA customer. As of June 30, 1976, BPA was serving 163 out of 646 delivery points by transfer. Wheeling and transfer optimize the use of existing transmission facilities, avoid duplication, and help avoid or postpone construction of new facilities. Actually the words are somewhat interchangeable.

Transfer proved especially useful for the rural electrification program. Private utilities generally were willing to transfer BPA power to rural electric cooperatives, as they did not represent a competitive threat to the companies. In most cases the loads were so small BPA could not have justified constructing transmission facilities to serve them. Moreover, BPA was virtually prohibited from building customer service facilities during the war years.

Wheeling and Partnership. The 1950 outbreak of hostilities in Korea and the 1953 Eisenhower partnership policies provided incentives for non-Federal construction of hydroelectric projects. This raised the question of how to transmit the power. The use of the BPA grid permits diverse participation in projects.

BPA signed a pioneering contract on March 16, 1953, to wheel 8,000 kW of power from Box Canyon Dam owned by the Pend Oreille County PUD to Whatcom County PUD. Two years later in response to the City of Seattle's proposal to purchase 48,000 kW of Box Canyon power, Regional Solicitor J. Lane Morthland prepared a nine-page opinion, dated December 19, 1955. It reviewed the legislative history and moved into new ground by presuming a "common reservoir of power" as the premise for Bonneville Project Act interchange clauses. Nevertheless, he anchored his opinion in part on action of the congressional appropriation committees in approving a 2-mile BPA line to Box Canyon Dam.

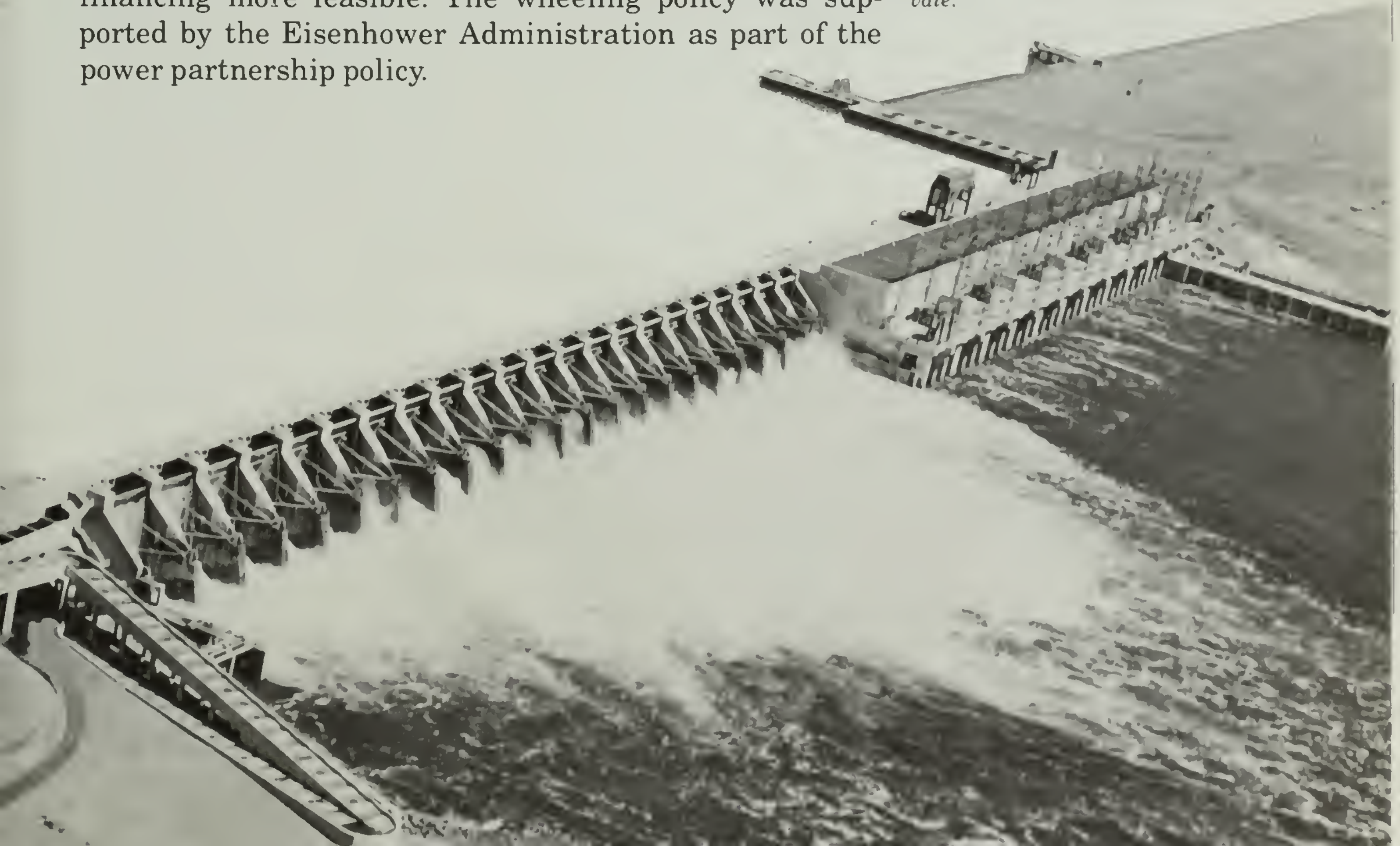
The Regional Solicitor issued a more conclusive opinion on February 29, 1956, entitled "Authority to Wheel Priest Rapids Power." He determined BPA's willingness to wheel "avoids duplication of major transmission lines." Also, that a legal "exchange" took place because the power was displaced. He found an anchor in the Priest Rapids Act of July 27, 1954, which requires integration of a project as part of a comprehensive plan.

On the basis of this opinion, BPA asked Congress for appropriations to build two major transmission lines, mainly for wheeling. This brought the issue to a head. The House Appropriation Committee deleted the lines, saying in its report:

"The Rocky Ford-Tacoma, and the Chief Joseph-Maple Valley Lines would set a precedent for wheeling non-Federal power long distances to integrate with the Bonneville grid. This is a major policy question and the Committee takes the position that proposals such as these should have separate legislative authorization before appropriations are requested."

The Senate reinstated the two lines. They were retained in the conference committee report. President Eisenhower signed the Public Works Appropriations Act of 1958 on August 26, 1957, as P.L. 85-167. The Senate report basically agreed with the Regional Solicitor's 1956 opinion that section 2(b) of the Bonneville Project Act was adequate authority to build transmission lines for wheeling.

Several additional advantages of wheeling soon became apparent. Financing new dams having numerous participants, such as Box Canyon Dam with sales to Whatcom PUD and Seattle as well as several points by Pend Oreille PUD, and the delivery of power from the mid-Columbia River dams would be easier and less risky if available transmission lines could be used so new lines would not have to be built. BPA agreed to wheel on an assured long-term firm basis, even if a major transmission line was out of service. This made the power more salable and project financing more feasible. The wheeling policy was supported by the Eisenhower Administration as part of the power partnership policy.



Priest Rapids Dam was built on the Columbia River by the Grant County PUD. Other PUD dams followed. Much of the power was sold on long term contracts to other utilities, public and private.

On October 1, 1957, BPA compiled a history on appropriations to facilitate wheeling the output of non-Federal generation plants. Extensive negotiations ensued on wheeling contracts and charges. BPA wheeling principles, policies, and computation of charges are well documented.

BPA annual reports mentioned plans for wheeling in 1955, authorization by the Secretary of the Interior in 1956, and establishment of wheeling procedures in 1957. The 1958, 1959, and 1960 reports each listed wheeling arrangements.

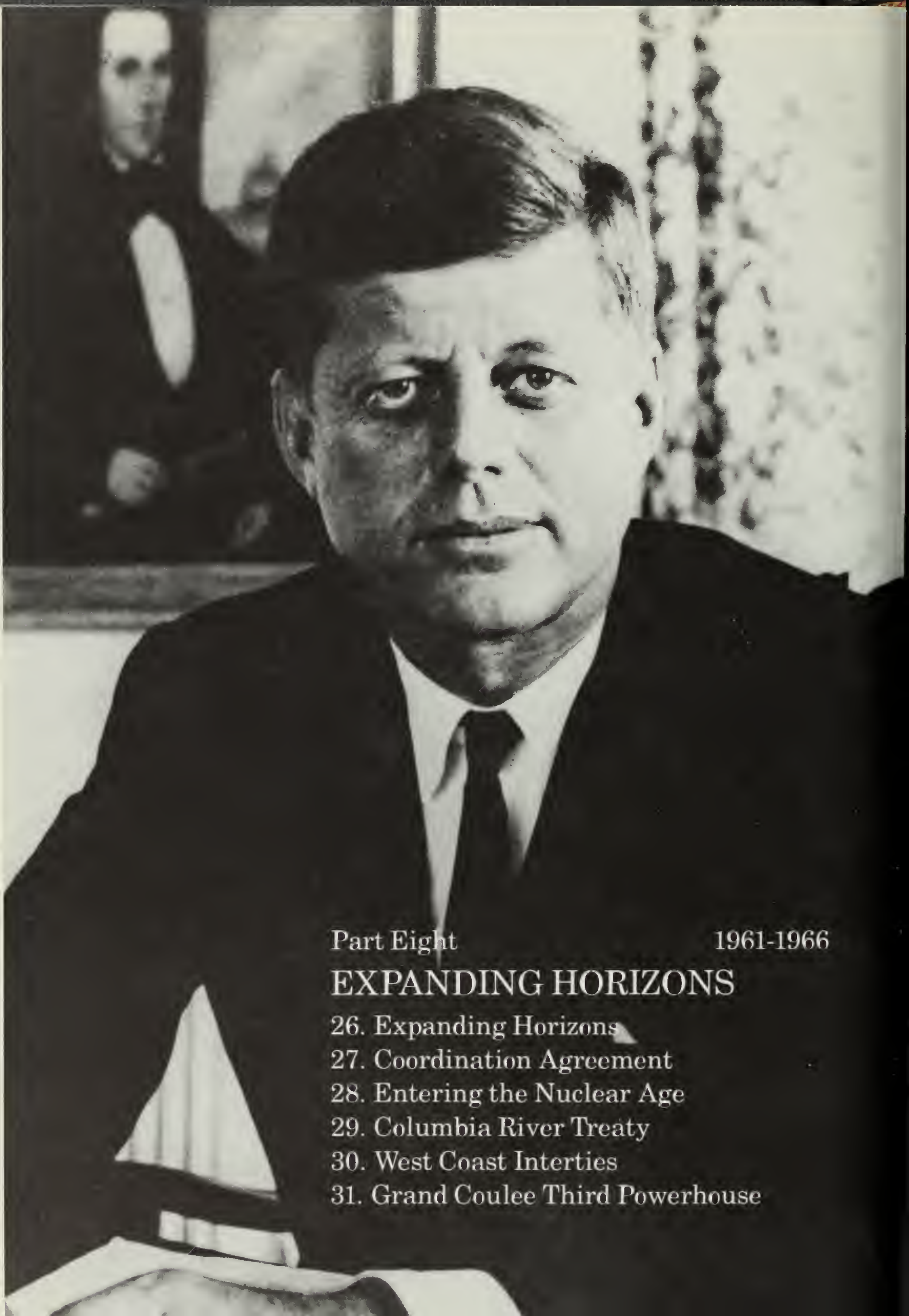
Wheeling Reaffirmed. During the 1960s the scope of wheeling was expanded by the Pacific Northwest-Pacific Southwest Interties, the Columbia River Treaty with Canada, and the Hydro-Thermal Power Program. For several years the growing amount of energy wheeled was indicated by the annual reports. The 1965 report devoted a full page to the history of BPA wheeling and noted BPA received $4.4 million that year to wheel 12.9 billion kWh. A graph in the 1967 report summarized 10 years of wheeling in terms of revenues and amounts of energy delivered. The 1971 annual report mentioned that the Office of Management and Budget had advised BPA on April 2, 1971, that it could provide wheeling in the BPA service area for non-Federal generating plants built as part of the Hydro-Thermal Power Program.

In 1974, the Federal Columbia River Transmission System Act reaffirmed and clarified BPA's full authority to wheel power. It added a requirement that BPA wheeling charges reflect an equitable allocation of costs of BPA transmission facilities between the delivery of Federal and non-Federal power and required confirmation and approval of charges by FPC.

Since 1974, annual reports have contained graphs on the amount of energy wheeled and revenue therefrom. The revenue for fiscal 1978 was $25.5 million for wheeling 19 billion kWh. The chief activity in 1976 was BPA's July 30 request to the FPC for an increase in wheeling charges averaging 22 percent. It was conditionally approved and then twice extended to July 1, 1980.

In summary, wheeling was an added function of the BPA grid system, a foundation for other new activities. Wheeling represented a marriage of the power partnership and grid system integrity. The availability of a marketing and wheeling service has facilitated non-Federal power development through facilitating diverse ownership. The addition of wheeling has helped strengthen the BPA grid. The added functions speeded the adoption of 500,000 volt transmission lines and more sophisticated control equipment. Wheeling has substantially eliminated or reduced duplicative transmission lines.

Finally, wheeling has helped change BPA from its original function of merely marketing Federal power to facilitating all power development in the region. This may well be the path of the future.



Part Eight 1961-1966

EXPANDING HORIZONS

26. Expanding Horizons
27. Coordination Agreement
28. Entering the Nuclear Age
29. Columbia River Treaty
30. West Coast Interties
31. Grand Coulee Third Powerhouse

26. EXPANDING HORIZONS

When you help build a region, you help build your nation.
–John F. Kennedy
Letter on BPA's 25th Year
August 20, 1962

An eyelash difference in the 1960 election greatly changed the Nation's direction including power policy. It provided the Pacific Northwest an opportunity unequaled since construction began in 1933 on Bonneville and Grand Coulee Dams. In no other historical period in the annals of BPA was so much accomplished in so little time.

The two purposes of this chapter are to describe the 1961-66 period as a unique historical setting, particularly the political climate for electric power issues, and to outline 23 BPA activities or accomplishments. The five chapters that follow this one discuss major BPA activities in terms of decisions and groups of policies involved. These are the Pacific Northwest Coordination Agreement, the Hanford New Production Reactor-Generating Plant, the Columbia River Treaty with Canada, the Pacific Northwest-Pacific Southwest Interties, and the Grand Coulee Dam Third Powerhouse.

The Democrats were optimistic after their landslide victory in 1958. They had portrayed themselves as fighters for the people's rights in the face of the Eisenhower policies. He had been pictured in numerous Congressional hearings as favoring private electric utility corporations over public and consumer-owned electric systems.

Within weeks after the 1958 election, the Democrats began campaigning for the presidency at stake in the November 1960 election. John Fitzgerald Kennedy, although handicapped by his identity as a Catholic, had the advantages of an early start and strong backing of a wealthy family.

He won by only 119,450 votes or less than one-tenth of one percent. The Electoral College cast 303 votes for Kennedy, 219 for Richard M. Nixon, and 15 for Senator Harry F. Byrd. In the 87th Congress, Democrats slipped slightly in the House with a 263 to 174 majority, and held their own in the Senate 65 to 35. The Republicans gained one governorship, leaving the Democrats with 34.

Despite his narrow victory, Kennedy exuded confidence toward "getting the country moving again." He announced the ten-year space program goal to put an American on the moon.

His speeches and messages to Congress spotlighted his favorable attitude toward the Federal power program and

President John F. Kennedy started and President Lyndon B. Johnson completed the Golden Age of the Federal Columbia River Power System.

necessary transmission lines, including inter-regional connections. He recommended $60 million be appropriated to construct a Federal generating plant at Hanford, but bowed to congressional opposition.

The 1962 election gave the Democrats a 258 to 177 majority in the House and 67 to 33 majority in the Senate of the 88th Congress.

Kennedy made many notable speeches in addition to his inaugural address and state of the union addresses. In fact, his narrow victory in 1960 appeared to mark the start of his 1964 Presidential campaign. He was in Seattle November 16, 1961, to honor Warren G. Magnuson on his 25 years in the U.S. House and Senate. He dedicated Oahe Dam August 17, 1962. He helped TVA celebrate its 30th birthday in May 1963. He spoke of a "nuclear plowshare" at the Hanford generating plant groundbreaking ceremony September 26. He was assassinated November 22, 1963, and was succeeded by his Vice President, Lyndon Baines Johnson.

Kennedy appointees to the Department of the Interior had a public interest orientation: Secretary Stewart L. Udall, Under Secretary James Carr, and Assistant Secretary Kenneth Holum all were sympathetic to BPA.

President Kennedy speaking at the ground breaking ceremony for the Hanford generating plant September 26, 1963.

Photo courtesy of WPPSS

President Lyndon Baines Johnson had helped establish a rural electric cooperative in Texas. He had an intimate knowledge of the rural electric and Federal power programs. He retained the Udall team in the Department of the Interior. Within the 11 months prior to the 1964 election he concentrated heavily on the Columbia River Treaty and the West Coast Interties, as discussed in subsequent chapters.

In the 1964 election Johnson defeated Senator Barry Goldwater 43.1 to 27.2 million, a plurality of 61.1 percent, exceeding Roosevelt's 1936 plurality. The electoral majority was 486 to 52. The 89th Congress increased its Democratic majority, 295 to 140 in the House, 68 to 32 in the Senate.

President Johnson committed ground troops to Vietnam in 1965, and the New York Herald Tribune coined the phrase "credibility gap." Johnson also adopted the policy of "butter and guns." The costs of his Great Society programs, combined with the costs of American involvement in Vietnam, began to outstrip revenues.

The November 1966 election slightly reduced the Democratic majority: 247 to 187 in the House and 64 to 36 in the Senate. The Democrats had strong majorities in Congress throughout the 1961-1966 period.

Of interest to the Pacific Northwest, on February 13, 1961, the Department of the Interior rescinded the Federal Power Policy issued by Secretary McKay. Secretary Udall's new Federal Power Policy avoided the extremes of the Ickes 1946 policy and the McKay 1953 reaction. Udall's revision was general, constructive, moderate, and oriented to the practical compromise of shared responsibility.

To head up the Bonneville Power Administration, Udall appointed Charles F. Luce, an attorney of Walla Walla, Washington, and a protege of Senators Jackson and Magnuson. Luce took office February 15, 1961, and served until August 30, 1966, when he became Under Secretary of the Interior. In 1967 he resigned and became chairman of the board and chief executive of Consolidated Edison Company in New York city.

Charles Franklin Luce was born at Platteville, Wisconsin, August 29, 1917. He graduated from the University of Wisconsin with honors and held a Sterling Fellowship at Yale University Law School. He was admitted to the Wisconsin bar in 1941, the Oregon bar in 1945, and Washington bar in 1946. He served as a law clerk to U.S. Supreme Court Justice Hugo L. Black, 1943-1944. He was a member of the BPA legal staff, 1944-1946; then practiced law in Walla Walla, 1946-1961. For 14 years he represented the Confed-

Charles F. Luce

erated Indian Tribes on the Umatilla Reservation and was successful in a $44.6 million settlement for Indian fishing rights at Celilo Falls. He gave up a lucrative law practice to return to BPA and Government service.

After taking the oath of office as Bonneville Power Administrator on February 14, 1961, Luce held a press conference at which he outlined his power program: the Hanford nuclear generating plant, implementation of the Columbia River Treaty, advocacy of long-distance transmission interties, full development of water resources, and industrial development.

Many entities besides BPA played major roles at this time in shaping Northwest power policies, notably Canada, British Columbia, B.C. Hydro, California, the Sacramento Municipal Utility District, Los Angeles and other California cities, virtually all West Coast electric utilities, various interests in Arizona and Nevada, the Atomic Energy Commission, Bureau of Reclamation, Corps of Engineers, and many groups within the Pacific Northwest.

BPA suffered financial deficits in 1958, 1959, and 1960, with indications of worse to come. These deficits were a specter of a day of reckoning, hanging like the sword over Damocles. The deficits both depressed and goaded the BPA staff.

In his annual reports and testimony before Congress, Administrator Luce repeatedly used the deficits as evidence of the need to take certain actions. A checklist and perspective is provided by the following list of 23 actions, programs, events, or decisions that took place during his administration. Some items began before and some continued after the Luce era. The major ones, which often involved multiple actions and many policies over lengthy time periods, are discussed in subsequent chapters.

It should be recorded here that Dr. Pearl, as the outgoing Administrator, had extended an unusual gesture to Luce. Pearl had his staff prepare an inch-thick book of BPA issues and problems as a briefing manual for his successor. Most of the problems dealt with by the following actions or events were in that book.

1. *Reorganization.* In contrast to Under Secretary Tudor's 1954 edict that BPA strictly confine itself to selling surplus power, Luce strengthened BPA's power marketing division, and created the planning section and power use section. He strengthened the role of the Area Managers and reorganized the Bonneville Regional Advisory Council.

2. *Coordination Agreement.* The next chapter discusses

the 1961-1964 negotiations of four successive coordination agreements which helped pave the way for coordination and other areas of negotiation.

3. *Hanford.* Chapter 28 covers this precedent-setting project, authorized in 1962 and begun in 1963.

4. *Improved cost allocations at McNary and The Dalles Dams.* The downward adjustment in the power cost burden at McNary became a precedent for other projects and helped lighten the BPA deficit. The Northwest Public Power Association had long recommended the change.

5. *Grand Coulee flood control allocation.* The sizable allocation to flood control reduced the power cost burden and BPA deficit.

6. *Twenty-fifth anniversary.* President Kennedy's August 20, 1962, letter, published in BPA's 1962 annual report and 25th anniversary booklet, opens with:

"When you help build a region, you help build your nation. This is the real significance of Bonneville Power Administration's first 25 years."

7. *Columbus Day Storm.* Winds exceeding 100 m.p.h. hit Pacific Northwest coastal states October 12, 1962 inflicting more than $1 billion in damages. The BPA system suffered $1.2 million in damages. BPA stiffened its specifications for transmission towers to withstand high velocity winds.

8. *Southern Idaho service.* On May 21, 1963, Secretary Udall authorized the Bureau of Reclamation to transfer the Upper Snake River drainage area, mainly southern Idaho, to the BPA power marketing service area, effective September 1. This finally placed all the American portion of the Columbia River Basin in the BPA service area. The initial annual saving to local utilities was $600,000.

9. *Systemwide payout.* On April 3, 1963, the Secretary approved systemwide amortization for the Federal Columbia River Power System, as discussed in the 1963 annual report, and approved by Congress in 1966. The change helped keep rates down and prevent unnecessary rate fluctuations.

10. *Direct Current Test Center.* Congress authorized the d-c test center to facilitate intertie studies. It was placed in service November 4, 1963, at Big Eddy Substation at The Dalles, Oregon.

11. *500,000 volt transmission.* The 1963 annual report announced the decision to build three transmission lines for 500,000 volt operation. This initiated the 500,000 volt overlay system to move large blocks of power, thus achieving more effective right-of-way use, and more economical transmission. The decision expanded the master plan of J. D. Ross and supplanted further installation of 287, 315,

and 345 kV lines in the Pacific Northwest.

12. *Columbia River Treaty.* Chapter 29 traces American and Canadian efforts to formulate the plan to develop the upper Columbia River for flood control and power production and incidental arrangements to sell the Canadian power entitlement. This includes establishment of the Columbia Storage Power Exchange. Treaty projects brought the region closer to the goal of cutting the record Columbia River flood in half to 600,000 cfs at The Dalles.

13. *Pacific Northwest-Pacific Southwest Interties.* This is a key achievement of the Luce era, and one of the most dramatic stories in BPA history (see Chapter 30).

14. *Wholesale rate review.* Administrator Pearl did not recommend rate increases in 1959, despite BPA deficits, because he felt the accumulated surplus would last through 1964 and by then some of the problems would be solved. He was right. Luce deferred rate changes in 1964, due to the press of other business, and then recommended a nominal 2.9 percent increase, effective December 20, 1965. The smallness of the rate increase reflected the confidence of the BPA staff that their programs would succeed.

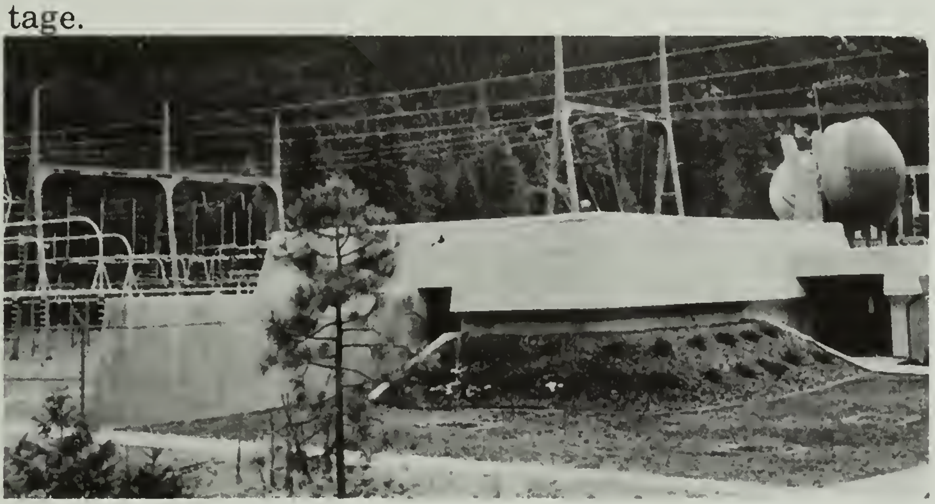
15. *Construction budget.* BPA's fiscal year 1956 construction budget was only $14.6 million, increasing gradually to $36.2 million by 1964. The Public Works Appropriations Act of 1965 contained $80.1 million for BPA construction, in addition to $7.3 million previously approved, for a total of $87.4 million. The next four budgets provided $97.8 million, $109, $110.5, and $104 million for a 5-year construction total of more than half a billion dollars.

16. *AT&T attacks BPA budget.* After Congressional authorization of the interties in August 1964, American Telephone & Telegraph Company began exerting pressure, especially on the Senate Appropriations Committee, to prevent allocation of any funds to BPA to provide communications and control facilities incident to the interties. AT&T contended a Bureau of the Budget circular required Federal agencies to use commercially available facilities whenever possible. BPA was strongly supported by many large utilities in testifying that the Bell System's reliability, security, and service quality were inadequate. Luce won his battle with AT&T.

17. *"Beautility."* BPA took a number of steps to improve the appearance of its facilities, especially beginning in 1964 and 1965. Administrator Luce became increasingly upset by the appearance of BPA substations particularly those located in developing residential areas. He called for more landscaping and low-profile designs. BPA designed the 500,000 volt delta configuration tower and adopted it

systemwide to reduce land use requirements.

BPA contracted with Stanton, Boles, MaGuire, and Church, a firm of consulting architects, notably Jack R. McFarland, to recommend improvements for the BPA system. McFarland's May 1966 report on improving the esthetic appearance of power facilities became a reference for electric utilities. BPA adopted recommendations that it reduce the visibility and profile of its substations, use pastel colors for equipment in its substations, use foliage for screening, and that it replace low-voltage transmission lines with high-voltage to use right-of-way to best advantage.



Libby Substation sets a new trend toward,more attractive BPA substations.

18. *Third Powerhouse.* The Columbia River Treaty assurance of more than 20 million acre-feet of upstream storage opened the door for installing more generators at Grand Coulee Dam and all downstream projects. Chapter 31 discusses authorization of the third powerhouse at Grand Coulee by the Act of June 14, 1966, P.L. 89-448.

19. *Irrigation Basin Account.* The Act of June 14, 1966, was amended by the Act of September 7, 1966, P.L. 89-561, to do two things: it confirmed the systemwide payout, "a consolidated financial statement," and provided for systematic handling of subsidies, from BPA power revenues, to help pay for investment in Federal reclamation projects in the Pacific Northwest.

20. *Wheeling by Idaho Power Company.* When BPA took southern Idaho into its service area, a request was pending in Congress for appropriations to build a high-voltage transmission line into southern Idaho. The Idaho Power Company strongly opposed the BPA line (See BPA annual reports for 1963 through 1965). The company finally agreed to wheel power in 1968.

21. *Industrial Sales.* Luce more than doubled direct sales of BPA firm power to industry. Industrial customers were required to take secondary energy as part of the package.

22. *Dittmer Control Center.* The interties increased BPA's responsibilities and led to an intensive review of the power

control and dispatching function with an eye toward computerization. This included automating much of the information gathering system, mainly by telemetering. The Northeast power blackout of 1965 increased the concern for reliability. The 1966 annual report called for building a "computer complex." Ten pages of the 1967 annual report were devoted to preliminary plans for what was to become the Dittmer Control Center at the J. D. Ross Complex in Vancouver, Washington.

23. *Hydro-Thermal Program.* BPA sought authority in 1951 to construct coal-fired steam electric generating plants. Many utility leaders had early-on recognized the necessity of moving from predominantly hydro to a hydro-thermal power system. BPA's 1965 annual report announced plans to open discussions toward planning future steamplants.

In all of these endeavors, Luce was assisted by an outstanding management team. Power Manager Bernie Goldhammer served as a principal idea man who at the time of his death, October 24, 1977, was acclaimed the "architect of tomorrow." Deputy Administrator Charlie Kinney came from the Corps of Engineers to serve as the "inside man." Russ Holt, Assistant to the Administrator, left Senator Jackson's staff to draft speeches and testimony for Luce and became known as BPA's "wordsmith." He then served with Luce in New York and returned to BPA in 1978. Russ Richmond, former Walla Walla Area Manager, who left to work in private industry, was lured back by Luce to become Field Operations Officer, then deputy to Luce and Black before becoming BPA Administrator in 1967. Although a lawyer himself, Luce leaned heavily on Harry Hogan, who served as Regional Solicitor, and Ken Kaseberg, Associate Solicitor, to carry the heavy legal load that went with the Luce program. As noted in Chapter 25, starting in 1949 near the end of the Raver period, the complete senior staff serving with each Administrator appears in the BPA annual report.

Bernard Goldhammer, upper, and Russell Holt were key members of the team with Charles Luce.

Luce also found strong allies for his program in the Washington PUD Association, managed by Ken Billington; the Northwest Public Power Association; and the Inland Empire Waterways Association, later renamed Pacific Northwest Waterways Association.

Luce left few stones unturned at the Department of the Interior, in the halls of Congress, at the White House, or at Ottawa. Chapter 30 focuses on his handling of the intertie campaign, a classic in the art of public administration. The five chapters which follow illustrate his low-key, relentless drive.

27. COORDINATION AGREEMENT

...in a project of this magnitude there had to be someone who was like a rock. There had to be someone in the middle who, to use the term so familiarized to the American people by President Johnson himself, was capable of getting people to sit down and 'reason together.' ...I know of no one that I have served with the last 3½ years in the highest offices of Government who is a better public servant, or one who combines the qualities that would enable us to solve a great controversy and put something together. He is a person who was able – because of his intellectual honesty, because of his integrity – to command the respect of everyone who sat around the conference table; and therefore I want to pay that special tribute in the presence of the President to one of his Administrators and one of my Administrators, Mr. Charles Luce, the Bonneville Power Administrator.

– Stewart L. Udall
Remarks at Portland, Oregon
September 17, 1964

Soon after he became Administrator, Luce sat down with representatives of the larger electric generating utilities in the Pacific Northwest to explore the possibilities of working out a coordination agreement for operation of the region's hydroelectric projects.

Luce asked his staff to negotiate on the basis of what he called the "single utility concept," that is, to operate the system as if there were one owner. Former BPA Chief Engineer Sol Schultz had suggested much the same approach in 1942 in helping form the Northwest Power Pool. The Federal Power Commission in its glossary of terms has long defined coordination among multiple owners as a mode of operation to achieve the benefits of integration as would be practical if there were only one overall owner. Luce explained his purpose,

"What we tried to do in the coordination agreement was to achieve the same mode of operation for all of the dams on the Columbia River and its tributaries as if one entity owned them all. Our premise was that by so operating such projects they would produce the maximum benefits for society. The tough negotiating problem was how to arrive at an equitable distribution of such benefits among the many entities which in fact owned the projects."

The utilities had been cooperating informally for almost 20 years. Operating personnel had been exchanging power through the voluntary Northwest Power Pool since 1942. Top utility officers had been meeting at the policy level, since 1946, as the Tacoma Conference, later known as the Pacific Northwest Utilities Conference Committee

(PNUCC). The group, initially made up of the larger generating utilities, became more complex in the 1950's as several Washington PUDs began building or acquiring dams, including five dams on the Columbia River, and selling much of the power to private utilities.

The Columbia River Treaty necessitated the development of a long-term, formal coordination agreement. Under the Treaty, Canada became entitled to one-half of the added downstream power benefits attributable to the Canadian storage dams, including benefits at the PUD-owned dams: Priest Rapids, Wanapum, Rock Island, Rocky Reach, and Wells. The Treaty required and assumed coordinated operation for optimum firm energy and peakload carrying capability. Canada sold its share to Northwest utilities for a 30-year period. The U.S. Government is signatory to the Coordination Agreement through Administrator Luce for the Department of the Interior and General William Lapsley for the Corps of Engineers. More recently, the Water and Power Resources Service, as the Bureau of Reclamation is renamed, has become a signer. They and their successors also represent the United States Entity under the Columbia River Treaty and are signatories in that added capacity. The signers to the agreement include five investor-owned utilities, PGE, WWP, PP&L, and MPCo; five public utility districts, Grant, Chelan, Douglas, Cowlitz, and Pend Oreille; three municipalities, Eugene, Seattle, and Tacoma; and the subsidiary of an aluminum producer that purchases a part of the output of Rocky Reach Dam. Idaho Power Company was omitted because the Company insisted on payment for coordinated operation of the Brownlee Dam even though the license required the Company to coordinate without entitlement to payment for downstream benefits.

In the three years between the Treaty signing in 1961 and ratification in 1964, coordination negotiations went through four agreements, beginning September 1, 1961, with the simple one-year Coordination Agreement. The second one-year agreement included a major concession by BPA to pay the non-Federal owners of upstream storage for assured benefits they provided downstream Federal hydroelectric projects.

Under the Federal Water Power Act of 1920, the FPC issues licenses with the understanding that the licensee shall pay the annual charge set by FPC for headwater benefits provided for its dam by an upstream dam, regardless of the ownership of the upstream dam. The United States is not required to pay a fee for benefits to downstream Federal dams because it is considered the owner of all waterpower subject to FPC jurisdiction. The Coordination Agreement, however, provides for Federal payments since headwater benefits are provided on an assured basis instead of in a haphazard manner.

The third set of negotiations resulted in the 10-year Coordination Agreement, effective September 1, 1963. It detailed procedures for computing the resulting firm load-carrying capabilities and reservoir payments, instead of specifying them in a schedule.

Negotiations went into high gear in 1964. Sessions continued day after day in an effort to arrive at a 39-year agreement to cover the 30-year sale to Pacific Northwest utilities of the Canadian power entitlement under the Treaty, beginning with the filling of Duncan reservoir in 1968 and for 30 years after filling Mica reservoir in mid-1973. The present Coordination Agreement was executed September 15, 1964, became effective January 4, 1965, and will end June 30, 2003.

The utilities had employed Gordon Culp, a Seattle attorney and former member of the staff of the Senate Committee on Interior and Insular Affairs, to coordinate the negotiations. He also served them in forming the Columbia Storage Power Exchange (CSPE) and has participated in PNUCC activities for more than 15 years.

The Coordination Agreement is limited to the optimum management of hydroelectric power through the use of more than 40 million acre-feet of Columbia River and Pacific Northwest reservoir storage and the regional transmission grid. The Agreement does not cover thermal power, a shortcoming mentioned in BPA's recent programmatic role environmental impact statement (EIS). The EIS offers recommendations to further improve coordination, and studies for that purpose have begun.

Prior to 1961 each major regional utility insisted on its independence. In many respects they continue in this insistence. For example, BPA aimed at maximum Federal generation and power sales. The Coordination Agreement assures reasonable independence, but its paramount objective is to optimize regional firm load-carrying capability such as would be achieved if there were a "single utility." The principles agreed to, early in 1961, continue to prevail. In simplified form they are:

— no party shall be required to operate its facilities in a manner inconsistent with nonpower uses;

— the combined power facilities of the parties shall be operated to produce optimum firm load-carrying capability;

— upon demand by a downstream entity, a storage owner shall release all water not needed for subsequent firm loads or shall provide energy in lieu thereof;

— each party shall be entitled to a firm load-carrying capability equal to its capability in the critical streamflow period with full upstream storage release, except for reimbursement of Canadian Treaty benefits and restoration of capability of parties which suffer loss in critical period capability as a result of the Treaty;

— firm load-carrying capabilities shall be sustained by exchange of energy between parties;

— each party shall accept energy which is surplus to other parties' needs for storage in available reservoir space;

— the obligation to reimburse Treaty power to Canada shall be shared by the projects which benefit from Treaty storage in proportion to their benefits;

— equitable compensation shall be made for the benefits from reservoir storage, including compensation by the United States to the extent consistent with applicable law;

— interconnecting transmission facilities shall be made available for coordination use subject to the owner's prior requirements;

— each party shall consult with the others in developing detailed plans for operation of its facilities;

— equitable charges shall be made for capacity, energy, transmission, storage, and other services; and,

— Bonneville Power Administration shall sell to the non-Federal parties the capacity they require for delivery of capacity benefits to Canada.

The Coordination Agreement is a lengthy, complex document. It is mentioned in BPA annual reports of 1961, 1962, 1963, and at more length in 1964. It is discussed in the BPA Draft Role EIS with respect to the possibility of including thermal power, short-term coordination, resource planning, and expanding coordination of peaking.

The Coordination Agreement was a gateway to other negotiations and demonstrated BPA's willingness to negotiate. It helped open new vistas and opportunities for the utilities to participate in BPA operating decisions. It helped end the passive role BPA played during much of the 1950s in favor of a dynamic role and accelerated activity.

28. ENTERING THE NUCLEAR AGE

Sir: Some recent work by E. Fermi and L. Szilard, which has been communicated to me in manuscript, leads me to expect that the element of uranium may be turned into a new and important source of energy in the immediate future...In the course of the last four months it has been made probable...that it may be possible to set up a nuclear chain reaction in a large mass of uranium, by which vast amounts of power and large quantities of new radium-like elements would be generated...

– Albert Einstein
Letter to F. D. Roosevelt
August 2, 1939

BPA received an urgent request in January 1943 to provide a sizable block of power for an unspecified "mystery" load in the desert area between the little Washington towns of Hanford and Richland, population 100 and 200, respectively. It was to fuel a plant producing plutonium for the atomic bomb.

In the next third of a century the tables turned. Uranium was used to fuel plants to produce electric power.

As war clouds dominated the European horizon in 1938, German scientists succeeded in splitting uranium atoms. They had achieved nuclear fission. Niels Bohr, Danish nuclear physicist, promptly sailed to the United States to meet with Enrico Fermi at Columbia University and Albert Einstein at Princeton University. From his arrival January 16, 1939, he urged experiments to confirm the German report. He predicted nuclear fission could touch off a chain reaction that would release considerable energy.

At the urging of his colleagues, Einstein sent a confidential letter August 2, 1939, to President Roosevelt pinpointing the military potential of atomic energy and Germany's awareness of this potential. Roosevelt responded by establishing the Office of Scientific Research and Development, headed by Vannevar Bush. Initial research at Columbia and Princeton was transferred to the "Metallurgical Laboratory" at the University of Chicago.

Using space beneath the football stadium, the group built a graphite-moderated nuclear reactor. They accomplished the critical chain reaction December 2, 1942, often referred to as the "dawn of the nuclear age." The group's concern that day, however, was whether the Germans had achieved it first, as they were presumed to have had an 18-month head start. The Atomic Energy Commission (AEC) History opens ominously:

"...the development of atomic weapons was an international achievement to which great contributions were made by European as well as American scientists and engineers. All were spurred by the agonizing fear that the Nazis were well ahead of the free world in the development of atomic weapons."

At Bush's recommendation months earlier, President Roosevelt directed the Corps of Engineers to establish the Manhattan Engineer District, headed by Maj. Gen. Leslie R. Groves. Its mission was to intensify the search for and mining of uranium, and develop industrial processes and facilities for atomic weapons production. Groves promptly began negotiating with duPont to design an atomic pile.

In January 1943 Groves selected the Hanford area as the site for several plutonium production reactors and separation plants. The Corps of Engineers paid more than $5 million for the 400,000 acres.

DuPont began constructing the $350 million Hanford Engineer Works March 22, and later was responsible for operating the facilities. The tent camp at Hanford gave way to barracks housing 51,000 people, and Richland expanded into a city.

The first Hanford reactor began operating September 26, 1944, and the first plutonium was delivered February 2, 1945. The first atom bomb was tested July 16 at Alamogordo, New Mexico. An atom bomb was dropped on Hiroshima, Japan, August 6, and another on Nagasaki on August 9.

The Hanford project has been acclaimed as a marvel of engineering and construction. The first volume of the AEC history, *The New World,* 1939-1946, by Richard G. Hewlett and Oscar E. Anderson, covers the roles of Hanford and the Manhattan Engineer District in producing the atom bomb. The bomb was produced in 31 months after selection of the Hanford site.

The war over, Congress passed the Atomic Energy Act of 1946, to transfer Manhattan Engineer District functions January 1, 1947, to the five-member AEC. Its mandate was to pursue peacetime uses of atomic energy. Nevertheless, the greater part of the AEC budget for the ensuing decade went into stockpiling nuclear weapons, hydrogen thermonuclear bomb demonstrations, and powering the nuclear submarine.

By the late 1950s, while the General Electric Company was under contract to operate the Hanford Works, GE Chairman Ralph Cordiner held a meeting of his Board of Directors in the Pacific Northwest, and proposed a study of using the waste heat, from the reactors already in service, to produce electricity. Industry objections, as well as technical and economic problems, quickly brought down this trial balloon.

In 1958 the AEC determined the additional military need for plutonium required a large production reactor be built. Congress authorized construction of the New Production Reactor (NPR) at Hanford, and, largely at the urging of Senator Henry M. Jackson and after a long legislative battle, provided the conversion feature so waste heat could be used to generate electricity. Construction began in 1959 and the plant went into operation in late 1963.

The conversion feature made three choices possible: produce plutonium only; produce plutonium and use the resulting steam in an electric generating plant; or change to a more efficient fuel and operate strictly for power production.

In 1961 President Kennedy recommended the installation of a Federal electric generating plant to make use of the 13 million pounds of steam per hour that would otherwise be wasted. Congress voted it down.

Opposition to Federal generation at nuclear plants had originated with the Eisenhower Administration and became Republican Party policy. Opposition also came from coal interests and private electric utilities. Hanford had reached an impasse.

Twelve years earlier, the Washington State Legislature in 1949 had created the Washington State Power Commission with authority to generate and transmit electricity. The law was amended in 1953 and 1955 to authorize two or more cities or public utility districts to form a joint operating agency. The Legislature abolished the Commission in January 1957 and transferred its powers to the prospective joint operating agencies.

That month, Earl Coe, State Conservation Director, approved formation of the Washington Public Power Supply System (WPPSS) by 16 public utility districts. Several years went by with WPPSS as a paper organization, and some sentiment developed in the legislature to deauthorize WPPSS. In 1960, however, Lewis County PUD asked WPPSS to build the Packwood Lake hydro project. The Supply System board seized the opportunity to get the agency into business and to test its authority to issue bonds. Administrator Luce went along with the plan by entering into a contract to facilitate handling the power output. This put WPPSS in position to handle the Hanford opportunity. WPPSS Managing Director Owen Hurd outlined a plan October 17, 1961, for WPPSS to finance Hanford generating facilities on a non-Federal basis. It was formalized November 28, 1961. The private utilities again opposed it.

Hanford Number 2 is pictured above under construction. Facing page features the Trojan 500-foot high cooling tower, the long generator, and at top a view of the reactor vessel being placed.

BPA Administrator Luce supported the WPPSS plan in testimony April 16, 1962, before the House Appropriations Subcommittee. The same day an Electrical World magazine editorial stated the WPPSS plan evidenced a "cynical disregard for the will of Congress." The General Accounting Office issued an opinion July 6, 1962, that the Atomic Energy Commission did not have the authority to enter into the WPPSS plan and would need Congressional approval to do so. The ensuing struggle was documented by Vera Edinger in the *Hanford Story* (1964). The House voted July 17 to prohibit the use of Hanford steam to produce electricity. The Senate agreed to the WPPSS plan August 1. The Joint Committee on Atomic Energy approved Senator Jackson's compromise proposal which would give half the energy produced under the WPPSS plan to private power companies. The House adopted the compromise September 14 and President Kennedy signed the Atomic Energy Commission Appropriations Act of 1963 (P.L. 87-701) September 26, 1962. A flurry of activity ensued.

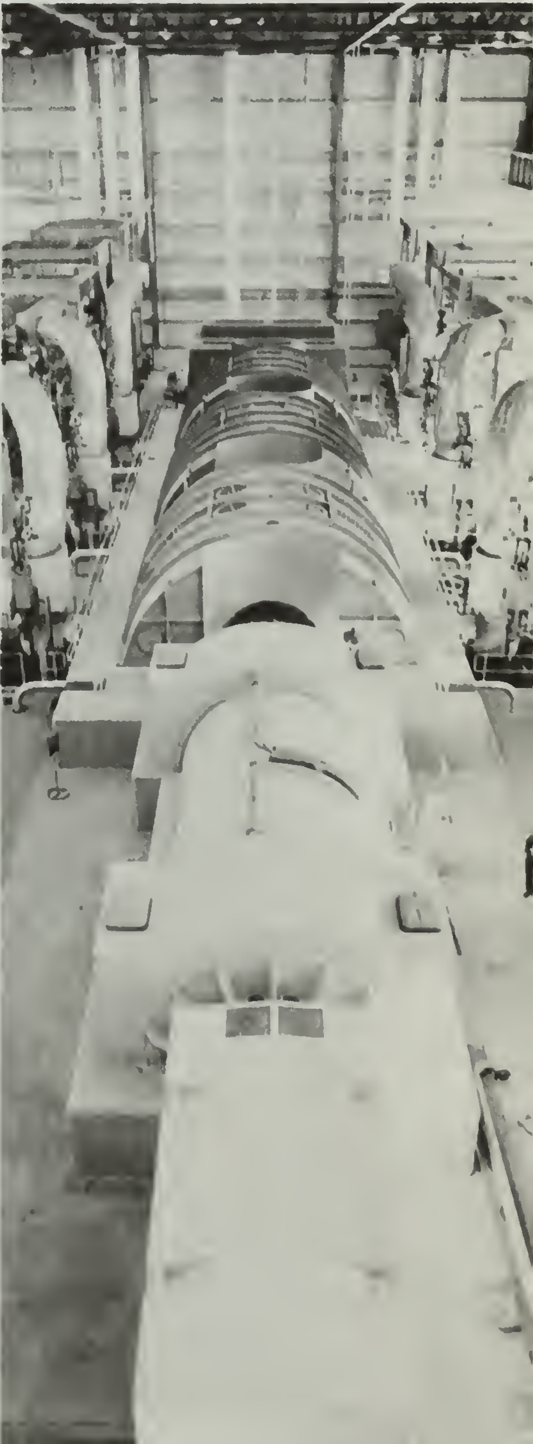
BPA agreed to exchange power from its system for Hanford energy, and worked out an exchange agreement under which a purchaser would obtain rights to BPA power at BPA rates in amount equal to offset the purchaser's share of the costs for the Hanford energy that it exchanged to BPA. The exchange arrangement carried out the directive of the Congress in section 112(d) of the 1962 Act, that:

> "Any losses to the Bonneville Power Administration in connection with the arrangements or sales authorized herein, shall be borne by its system customers through rate adjustments."

This policy was also emphasized in the House and Senate reports on the bill. Seventy-one public agencies oversubscribed the entire output by January 14, 1963. The private utilities accepted their half of the output. All entered into the Hanford Exchange Agreements with BPA. The $122 million bond issue to finance construction of the WPPSS generating plant was sold May 8 at 3.26 percent interest. Ground was broken September 26 by President Kennedy with 40,000 people in attendance to hear his speech.

Construction proceeded through 1964 and 1965, followed by testing early in 1966 and commercial operation on November 29. Five years of favorable generating operation followed, although in January 1964 President Johnson announced the cutback in plutonium production and retirement of the eight older Hanford reactors.

In January 1971, with less than one day's notice, AEC shut down the N-Reactor, which, under contract between



Four thermal plants are on the line: Centralia, Trojan, Hanford NPR, and Boardman.

AEC and WPPSS, supplied steam to the WPPSS 800-megawatt Hanford turbine generator project. After extensive negotiations, AEC restarted operations on July 1, 1971, for three years of additional operations, but at higher steam cost. Extensive further studies led to extensions 1974-77, 1977-83, still as a dual-purpose operation, and at further rises in steam costs to mid-1983.

Hanford was by far the largest nuclear fuel generating plant in the United States. For a time it produced more electricity than all other commercial nuclear-fueled plants combined. In its best year to date, 1973, it produced 4.522 billion kWh, and by then reached a world record cumulative of 24 billion kWh total. By the end of 1976, its continuing cumulative total reached 33 billion kWh. It especially provided yeoman service during the 1977 drought year producing 4.1 billion kWh.

Hanford failed to live up to all of the promises and hopes. The plant initially experienced frequent and lengthy outages, but in later years has operated with greater reliability. On March 25, 1977, WPPSS and ERDA agreed to extend the present contract beyond July 1, 1978, to June 30, 1983, to permit continued operation.

Over the years the Hanford complex has become involved in broad, national nuclear issues. Waste management problems, fuel processing, and liquid sodium technology place the Hanford complex on the front line of research and also on the front line of opposing views toward using nuclear fuel to produce power. Hanford has the potential for becoming a nuclear energy park with fuel processing and enrichment, generating and waste management facilities.

The Hanford complex has evolved from the one-contractor pattern of duPont and then General Electric to involvement of many contractors. WPPSS is rapidly becoming the main tenant of the Hanford Reservation, with three nuclear generating plants under construction.

Meanwhile, Trojan, built by Portland General Electric Company near Rainier, Oregon, commenced operation in 1976 in time to help the region's power supply situation during the 1977 drought. Trojan is the region's second and now largest nuclear-fueled generating plant. Construction has begun or approvals are being sought for a dozen or more additional thermal plants, both coal-fired and nuclear, in the Pacific Northwest. These will involve added transmission responsibilities for BPA.

29. COLUMBIA RIVER TREATY

Increased power on the Columbia depends upon storage. Without vastly increased storage the power output of the Columbia Basin will be cut in half.

–Ben E. Torpen

The Columbia River Treaty with Canada provides for joint development of the river for flood control and power benefits for both countries. Nature provided the physical setting and opportunity. Extensive studies from 1944 to 1959 provided the basis for five years of negotiations, followed by almost nine years of construction.

Treaty implementation involved many contractual and institutional arrangements. Although the Treaty was signed January 17, 1961, it was not ratified by Canada until 44 months later because of the time needed to work out the complex arrangements, including such directly interrelated programs as the Pacific Northwest Coordination Agreement and the Pacific Northwest-Pacific Southwest Interties. The Treaty in turn facilitated and required installation of the third powerhouse at Grand Coulee Dam and additional generators at downstream projects.

The Columbia River Basin comprises 259,000 square miles, of which 220,000 square miles, or 85 percent, are in the United States, and 39,000 square miles, or 15 percent, in Canada. The Canadian portion appears on the map as a comparatively small triangle, the base of which extends 276 miles along the United States-Canadian border and the apex is 270 miles north of it near Mount Robson. The Rocky Mountains mark the eastern edge of the triangle. Parallel and immediately west of the Rockies is the Rocky Mountain Trench which includes the Yukon River to the north and Bitterroot River to the south. Located in this trench are the southward flowing Kootenay River (Kootenai in the United States), the 2,650 foot elevation Columbia Lake from which the Columbia River begins its northward flow, and the Canoe River which flows southward to join the Columbia just before it breaks through the Selkirk Mountains and turns southward down the Selkirk Trench, through the Arrow Lakes, to Grand Coulee Dam.

Moisture-laden westerly winds off the Pacific Ocean, after crossing the Coast Range and Fraser Plateau, are intercepted by five roughly parallel mountain ridges, the Cariboo, Monashee, Selkirk, Purcell, and Rockies ranging in elevation up to the 12,972 foot Mt. Robson. Together they serve as an effective moisture collection system. Annual precipitation at high elevations has reached 120 inches, and averages 40 to 45 inches in mountainous areas. Additionally, the Fraser Plateau averages 25 inches of precipitation which runs off into the Okanagan River (Okanogan in the United States), which joins the Columbia at Brewster, Washington, just downstream from Chief Joseph Dam.

Precipitation in the mountains is mainly winter snowfall. Much of it packs down into extensive ice fields, the largest being the Columbia Ice Field, which accumulate from year to year and release water throughout the summers. Although only 15 percent of the Columbia Basin is in Canada, about 30 percent of Columbia River flow originates there. The predominant summer flows are a major factor in Columbia River floods. The record 1894 flood, which measured 1,240,000 cfs at The Dalles, included a flow of 680,000 cfs in the Columbia at the Canadian border. This included the Kootenai and Clark Fork-Pend Oreille. By contrast, the flow in winter, when the power need is greatest, has been as low as 13,000 cfs at the border, an erratic ratio of 52 to 1. At Revelstoke, B.C., the largest measured flow was 99 times the lowest.

Thus the physical setting, precipitation, and resulting hydrology of the upper Columbia River in Canada intensify the problems of controlling floods and meeting winter electric power requirements.

Traditionally in the United States, as in Europe, population has centered at the lower ends of rivers. Development of water and river resources has emphasized harbors, lower river navigation, and levee construction. The Corps of Engineers planning followed the pattern in the Mississippi and eastern rivers, although in 1851 Charles Ellet Jr. had recommended upstream flood control storage on tributaries, and cutoffs on the lower Mississippi.

Not until the present century did the concept of storage near river headwaters win a measure of acceptance, and that occurred mainly in the West. In urging Congress to establish the Reclamation Service, President Theodore Roosevelt called for building dams to create dual-purpose, upstream storage reservoirs to capture and retain flood waters for irrigation. In his message to Congress, December 3, 1901, he stated:

"The forests alone cannot, however, fully regulate and conserve the waters of the arid region. Great storage works are necessary to equalize the flow of streams and to save the flood waters. Their construction has been conclusively shown to be an undertaking too vast for private effort. Nor can it be best accomplished by the individual States acting alone. Far-reaching interstate problems are involved; and the resources of single States would often be inadequate. It is properly a national function, at least in some of its features. It is as right for the National Government to make the streams and rivers of the arid region useful by engineering works for water storage as to make useful the rivers and harbors of the humid region by engineering works of another kind. The storing of the floods in reservoirs at the headwaters of our rivers is but an enlargement of our present policy of river control, under which levees are built on the lower reaches of the same stream."

Within seven years he broadened his concept to unified river development, or comprehensive, integrated, multipurpose development of water resources. Each river system is a single unit (Chapter 2).

The Reclamation Service tamed flood waters and put them to work. Notably, Hoover Dam stopped the devastating Colorado River floods and provided the water to transform the Imperial Valley into productive land. Hoover Dam proved the feasibility of upstream storage.

The Corps of Engineers 1932 Columbia River report barely mentioned river regulation. The report stated that there was no substantial flood problem that could not be mitigated locally. Spurred by power needs for war production, the Corps and BPA studied upstream storage possibilities in 1943. Subsequent Congressional hearings led to the authorization of Hungry Horse Dam in 1944. On March 9, 1944, the Canadian and United States Governments asked the International Joint Commission, created by the Boundary Waters Treaty of January 11, 1909, to conduct an inquiry:

"...whether a greater use than is now being made of the waters of the Columbia River System would be feasible and advantageous..."

In his 95-page memo on "Storage for Power" in August 1945, Torpen declared storage was the key to Columbia River power development. By 1948 his ideas were nominally accepted.

The Corps of Engineers' revised Columbia River 308 report of October 1948 included a 56-page appendix on the Canadian portion of the Columbia Basin. The Corps advised:

"It is concluded that it may be feasible ultimately to develop more than 20,000,000 acre-feet of additional storage within the Columbia Basin partially or wholly in Canada."

* * * *

"Such development of storage in both nations would solve the serious flood problems of each country to a high degree of effectiveness not possible by any other means.

"Substantial storage ultimately must be developed in Canada if economic utilization of the Columbia River water resources is to be accomplished."

The Corps' quickly modified report recommended several large upstream storage dams. The small Albeni Falls Dam was built. Libby was authorized contingent on approval by Canada of 42 miles of the reservoir in Canada. The high Hells Canyon Dam storage proposal, although supported by BPA, was abandoned by the Eisenhower Administration in favor of a greatly reduced storage capacity.

Opposition, mounted toward virtually all upstream storage proposals such as Nez Perce Dam, Wenaha, Canyon, Glacier View, Spruce Park, Kooskia, Enaville, Nine Mile Prairie, Paradise, Knowles, and others. A more significant deterrent was the general unwillingness, in face of opposition, of any Federal agency to sponsor upstream storage. The Truman Administration, largely through the Bureau of Reclamation, made an effort to include more upstream storage for the Pacific Northwest in the River and Harbor and Flood Control Act of 1950. The effort failed in part because of the enmity existing between the Bureau of Reclamation and the Corps of Engineers at that time, and because of the fact that the Senate Public Works Committee considered it inappropriate to authorize projects, in a Corps of Engineers bill, for construction by the competing Bureau of Reclamation. Shortly thereafter the Eisenhower no-new-starts policy discouraged any Federal dam proposals. Nonetheless, Bruces Eddy Dam (renamed Dworshak) was authorized in 1962, and later built. It was a token effort.

In 1954 Kaiser Aluminum & Chemical Corp. proposed a $30 million dam at Castlegar, British Columbia, to increase Arrow Lakes storage capacity. The contract signed by Kaiser and the British Columbia Government September 17 was stalemated when the Canadian Parliament enacted Bill No. 3 which required a Federal license for such projects. The Puget Sound Utilities Council in 1955 proposed the $250 million Mica Dam to produce 1.8 million kW of prime power in the United States and enable development of 1.4 million kW of prime power in Canada.

Soon after his election in November 1954, Oregon Senator Neuberger began laying the foundation for developing upstream storage in Canada. The Canadian Parliament held hearings on development of the upper Columbia in the spring of 1955. General Andrew McNaughton, International Joint Commission Canadian Section chairman, spoke on diverting Columbia River waters, about 15 million acre-feet or 67.7 percent of the flow at Revelstoke, into the Fraser River. Parliament appropriated funds May 13 for studies on diverting the Kootenay and Columbia.

Neuberger visited Canada in October 1955 and reported his findings to the U.S. Senate Committee on Interior and Insular Affairs. The Committee held four days of hearings on Upper Columbia River Development in the spring of 1956, and six days in the spring of 1958. Neuberger urged raising the Columbia River development question to the diplomatic level for active negotiation. The Committee hearings undoubtedly had a favorable effect, and the Eisenhower Administration was sympathetic to the Army's Libby Dam proposal. In April 1959 the United States and Canada received the report prepared belatedly by the International Columbia River Engineering Board in response to the two governments' March 9, 1944 request. Canada had commissioned seven major engineering studies from 1956 through 1961 to explore the alternatives.

The International Joint Commission reported December 29, 1959, on the benefits of any proposed development and how they might be apportioned. The report was based on a special study requested January 29, 1959, by the United States and Canada. The two governments began diplomatic negotiations February 11, 1960. The nine negotiating

President Dwight D. Eisenhower and Canada Prime Minister John G. Diefenbaker sign the Columbia River Treaty January 17, 1961.

sessions gave birth to the Columbia River Treaty. The signing of the Treaty on January 17, 1961, however, did not provide British Columbia with a way to carry out the development.

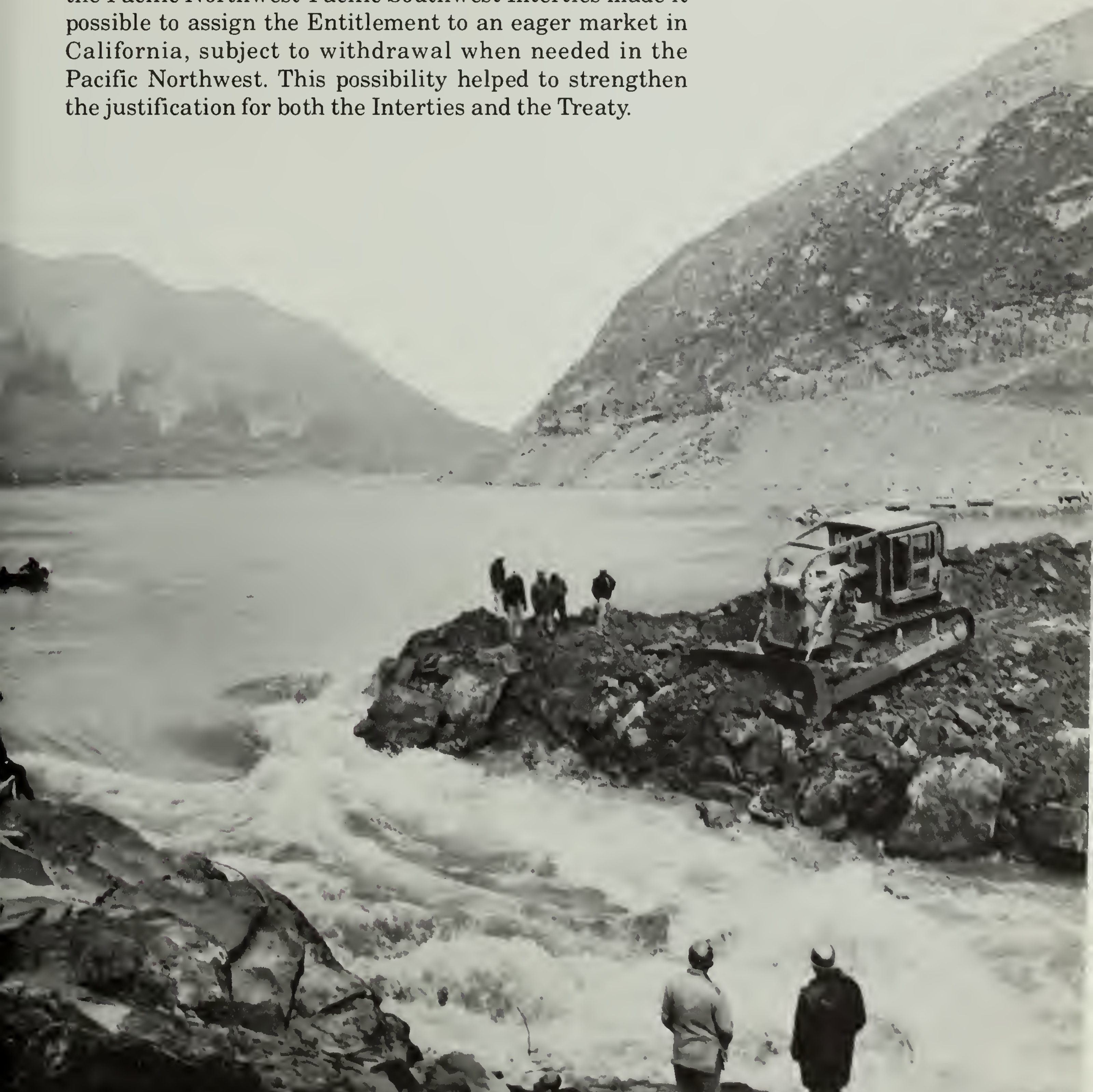
Dr. Hugh L. Keenleyside, Chairman of the British Columbia Power Commission set up in 1945, visited Administrator Luce and his top staff members February 15, 1961, at Portland. This was one day after Luce took office. He indicated British Columbia probably soon would become a public power province. This would affect implementation of the Treaty signed the previous month. Keenleyside and Luce played crucial roles in negotiations during the ensuing 44 months.

Many groups were involved in dozens of negotiating sessions. The Pacific Northwest Coordination Agreement was negotiated and adopted. Pacific Northwest-Pacific Southwest Intertie arrangements were completed, including the temporary assignment of Canadian entitlement power to various customers in California. Treaty negotiators had agreed that half the additional power made useable in the United States from the release of Canadian storage be delivered to Canada for its use. Many requirements changed between the Treaty signing in 1961 and ratification in 1964.

For some years British Columbia Premier Bennett had been pushing economic development, particularly in forestry and mining, northward in British Columbia. This included private development in the Peace River watershed where the British Columbia Electric Company had established a subsidiary to develop hydroelectric power resources. When this did not progress to his satisfaction, Bennett presented a bill to the British Columbia Parliament August 1, 1961, to expropriate B.C. Electric and its Peace River subsidiary. It carried unanimously. The new crown corporation retained the name B.C. Electric Company. On March 30, 1962, the B.C. Power Commission and B.C. Electric Company were merged and named British Columbia Hydro & Power Authority, better known as B.C. Hydro. Dr. Gordon Shrum and Dr. Hugh Keenleyside thereupon became co-chairman of the enterprise. In a division of work, Shrum supervised the Peace River development while Keenleyside handled the Columbia River program and the various aspects of the Columbia River Treaty.

A contractor for B. C. Hydro is shown completing the upper cofferdam at the Mica Dam construction site and diverting the Columbia River into the diversion tunnels.

Because the large Peace River Dam was already being built, British Columbia did not at that time need the Canadian Entitlement provided by the Columbia River Treaty. British Columbia then advocated selling the Entitlement to one United States entity which would prepay for 30 years in a lump sum sufficient to finance construction of the three Canadian upstream storage dams provided for by the Treaty. Neither did the Pacific Northwest need the Entitlement power just then. Plans pending for the Pacific Northwest-Pacific Southwest Interties made it possible to assign the Entitlement to an eager market in California, subject to withdrawal when needed in the Pacific Northwest. This possibility helped to strengthen the justification for both the Interties and the Treaty.



Chelan, Douglas, and Grant County PUDs provided the leadership in establishing the Columbia Storage Power Exchange (CSPE) as a nonprofit corporation May 11, 1964, to issue revenue bonds to purchase the Canadian Entitlement. CSPE arranged contracts in the BPA area with four private utilities to purchase half the Entitlement and 37 public and cooperative bodies the other half, and this group in turn resold the same temporarily in California. Based on contracts, CSPE sold $314.1 million in revenue bonds on August 26 at 3.85 percent interest. After setting aside funds for interest for the 9-year construction period, CSPE

The maple leaf shows Mica Dam to the right, Keenlyside Dam at center, and Duncan Dam to the left. Bottom picture is Libby Dam. Picture above is Columbia Lake in Canada starting point of the Columbia River.

on September 16 gave some $254 million to Canada and thus to British Columbia Hydro and Power Authority (BC Hydro) to build the three dams. Meanwhile, the Treaty Protocol was signed September 16, 1964, by President Johnson and Prime Minister Pearson at the Peace Arch in Blaine, Washington. Papers were exchanged in Ottawa and the $254,000,000 check passed from hand to hand in New York. The next morning President Johnson spoke at the Intertie Victory Breakfast in Portland to 1,100 persons including representatives of the largest electric utilities of the West Coast.

The Treaty resulted in building, reading from top, Mica Dam, Duncan, Keenleyside, and, in the U.S., the Libby Dam.

BC Hydro completed the 1.4 million acre-foot Duncan project July 31, 1967, well ahead of the scheduled April 1, 1968, date. Keenleyside Dam with 7.1 million acre-feet of storage in the Arrow Lakes was in service October 10, 1968, well ahead of the April 1, 1969, schedule. Mica Dam with 7 million acre-feet of "treaty" power storage was completed three days ahead of the April 1, 1973, deadline.

The United States paid Canada the portion of the $64.4 million flood control payment attributable to each project as it was completed, plus some additions for earlier completions. Of the 15.5 million acre-feet of storage, 8,450,000 acre-feet is committed to flood control: 1,270,000 at Duncan, 7,100,000 at Keenleyside and 80,000 at Mica. Some 7 million acre-feet at Mica is available to the United States for emergency flood control storage in the event of a severe flood threat. The United States would pay extra at the time under terms of the Treaty and the Annex. BC Hydro increased Mica storage far beyond Treaty requirements to 12 million acre-feet, some of which is dead storage, and enlarged the generating plant from the original 1.8 million kW to a potential 2.5 million kW. Four of six 434 MW Mica generators were in service as of 1978.

The Canadian Entitlement under 1974-75 conditions amounted to one-half of 2.8 million kW and 13.3 billion kWh per year, declining over the 30-year period to one-half of 740,000 kW and 3.6 billion kWh in 2003. That is the year the last of the bonds will be retired.

The Entitlement benefits cited do not include Libby Dam benefits. British Columbia acquired the 42 miles of land for the Libby Dam reservoir in Canada in return for 200,000 kW of Libby Dam downstream benefits for lower Kootenay River projects in Canada.

Soon after the tenth anniversary of the Treaty in 1974, now-retired Dr. Keenleyside released a four-page article "Ten Years Later: The Results of the Columbia River Treaty." He set forth his conviction that Treaty benefits to Canada have proven more valuable than foreseen.

30. WEST COAST INTERTIES

Here, in the Northwest, America is moving again. And all the world knows it. This intertie which is the result of so many brains and so much work, and such great efforts, is the most exciting transmission system in history. It makes us world leaders in direct current transmission. It will carry from the Peace River to the Mexican border enough power for five San Franciscos.

– Lyndon B. Johnson
Remarks at Portland, Oregon
September 17, 1964

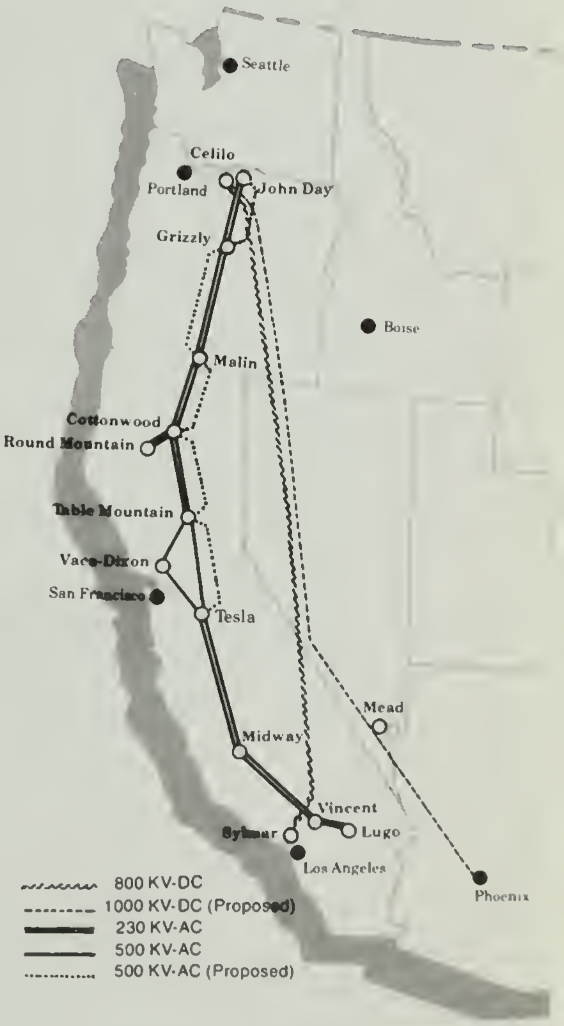
The interconnection of two large electric power pool transmission systems has resulted in such substantial benefits it is a wonder they were not joined sooner. The history of the West Coast Interties is dramatic and instructive. It involved many technological, political, and economic obstacles.

The idea of a 220,000 volt interconnection from Vancouver, B.C., to Los Angeles, California, was proposed in 1919 by Professor Carl Edward Magnusson. A proposed transmission grid system for the Pacific Northwest was depicted on a map drawn November 1, 1935, by Charles E. Carey, an electrical engineer with the Pacific Northwest Regional Planning Commission (PNWRPC) and later with BPA. It showed Seattle, Spokane, and Portland interconnected as a hub from which 230,000 volt lines radiated out to Great Falls and Butte, Montana, through southern Idaho to Salt Lake City, north to Vancouver, BC, and south to California.

The map was the centerpiece of the PNWRPC report which President Roosevelt used as the basis for urging Congress to create BPA. For the past 40 years BPA has implemented the Carey grid system concept.

The proposal for the intertie with California was not actively considered until the 1947-1951 period. The FPC published a small map November 23, 1947, showing electric intertie possibilities for the United States including the California intertie. BPA's 6-year Advance Program in January 1948 included the 230,000 volt transmission loop in southern Oregon via Medford and Klamath Falls and a line south into California. The name of the interconnection has varied with time. The original single line proposal was called the California intertie. BPA adopted the Pacific Northwest-Pacific Southwest Interties and this is the official, proper name. The public often calls them the West Coast Interties.

Early in 1948 central California had a severe drought. The Portland Oregonian of February 4, 1948, reported



PACIFIC INTERTIE

California had drastically curtailed power production. William Warne, an assistant secretary of Interior, wrote Congressman Norris Poulson of California on March 23, 1948, that it would be practical to divert Columbia River water to California.

Congressman Claire Engle of California testified before the House Appropriations Committee April 12, 1948, on the need to electrically interconnect California with the Pacific Northwest. The Northwest Public Power Association wrote Engle April 17 urging that any intertie be limited to dump power. Engle replied April 24 that he agreed. On April 28, he introduced HR 6367 to authorize construction of the intertie on the basis it be limited to the exchange or sale of dump power.

BPA Power Manager William A. Dittmer told the Bonneville Regional Advisory Council April 29-30 that BPA, even under tight power supply conditions, could send California an average of 75,000 kW or about 620 million kWh per year. He added that California could use twice that much just for fuel displacement.

At the Northwest Public Power Association convention at Port Angeles, Washington, August 12, 1948, Ben W. Creim, power manager of the Bureau of Reclamation regional office at Sacramento, California, told how an intertie could have prevented the energy shortage in California and could prevent the pending peaking power shortage in the Pacific Northwest. He had been REA engineer and then a BPA staff member before becoming power manager of the Central Valley Project (CVP). He was well known and respected in the Pacific Northwest and in public power circles.

In his speech he criticized Pacific Gas and Electric Company management for underestimating post war loads and failing to prepare for one of the largest power shortages in the history of the United States. California appointed a power czar early in 1948 to mandate a 20 percent curtailment in electric loads in the PG&E service area for several months. At the same time the Pacific Northwest was preparing for a peaking power shortage. It occurred in December 1948.

Creim advocated a 215-mile BPA-CVP 230,000 volt intertie to: increase the dependable capacity of both systems and increase revenues; provide reserve power for emergencies; facilitate marketing of BPA surplus energy; conserve about 2 million barrels of fuel oil per year; and serve national defense production power needs. He estimated that BPA would market 1.5 billion kWh per year, and resulting revenues would return more than twice the line's annual carrying charges.

Meanwhile Warne's letter, which appeared in the April 1 Congressional Record, created shock waves in the Pacific Northwest. There was a hue and cry that California intended to take the Pacific Northwest's water. Northwest candidates for public office voiced opposition to the proposed water diversion. Federal power program opponents garnered support for the interstate compact they long had been advocating when they claimed its main objective was to prevent diversion of Columbia River water to California and Arizona.

The Intertie thus became embroiled in the water diversion issue. This caused concern because of California's growing political strength in the House of Representatives and in Presidential elections. Consequently there was little progress on the intertie idea in 1949 and 1950, and actually some backsliding.

A Bureau of Reclamation 1949 study focused on how the Central Valley Project might obtain energy from BPA at 1.5 mills per kWh and resell it at a substantial profit to subsidize irrigation in the Central Valley. At an Interior Department meeting in Washington, D.C., BPA Administrator Raver and Bureau of Reclamation Commissioner Mike Straus got into a shouting match on the issue. Also at issue was a proposal that the Bureau take control of BPA energy at the Oregon-California border to market it south of there.

Cognizant of the Korean crisis, the Defense Electric Power Administration and Defense Power Administration deemed on January 3, 1951, that the interconnection was in the interest of national defense. On January 16, BPA and the Bureau determined the basis for an agreement and the price of Intertie power. On January 17, the Secretary of the Interior directed BPA and the Bureau to proceed with construction.

However, on April 20, 1951, the House Appropriations Committee (H. Report No. 339-82/1) reiterated its 1950 directive that the CVP-BPA interconnection was not to be considered as authorized and no funds should be expended for it. It also directed the Secretary of the Interior to report why the Bureau had spent $116,084 in late 1950 in contravention of the Committee's 1950 directive. A Bureau employee froze to death while surveying for the line in the Siskiyou Mountains.

Again in its March 21, 1952, report (H. Report No. 1628-82/2), the House Appropriations Committee directed that the intertie should not be built by Federal or non-Federal interests until an exhaustive study had been accomplished. That put the intertie proposal to rest until the late 1950's.

When he ran for the Senate in 1954, Neuberger repeatedly pointed out that his opponent Senator Cordon had been instrumental in forcing BPA to stop construction of its 230,000 volt line from Redmond to Klamath Falls, Oregon, and to sell its material, at cost, and right-of-way along the route south of Yamsay to the California-Oregon Power Company (COPCO), later merged with Pacific Power and Light Company. When Neuberger defeated Cordon and became a member of the Senate Interior and Insular Affairs Committee, he arranged for the Committee to employ an Oregon attorney knowledgeable in power, Milton C. Mapes.

One of Mapes' assignments was to observe the use made of the Yamsay-Klamath Falls 230,000 volt line after its completion, since COPCO had insisted the line was not needed. This led naturally to surveillance of the proposal of COPCO and PG&E to extend the line from Klamath Falls into California. The research conducted by Mapes, as shown in his memorandums to Neuberger, verified the Redmond-Yamsay-Klamath Falls line was not needed by COPCO – except as the first leg of the California intertie.

By 1958 the motivation for installing the intertie had changed substantially. In 1948 the focus was on the California drought, and the leadership came from the Bureau of Reclamation, FPC, and DEPA, with BPA in a secondary role. During the Eisenhower period the Federal agencies were dormant.

The 1958 revival was initiated by the Pacific Gas & Electric Company. In the post war period it had shifted from a predominantly hydro system to a hydro-thermal system, and by 1958 to a predominantly oil-fired thermal system. The cost of fuel oil had increased from $1 per barrel to $2.50.

BPA also had a new and stronger motivation. The continued slump in the aluminum market in 1958 had reduced BPA secondary energy sales. Installation of non-Federal generators in the Pacific Northwest had cut into BPA's normal power sales market. This resulted in BPA's first financial deficit, and the beginning of six years of serious deficits.

PG&E had approached BPA Administrator Pearl in 1958 with a proposal that PG&E and COPCO build an intertie. PG&E is one of the largest electric utilities in the United States, formed through the merger of 520 electric systems in central and northern California from the Tehachapi Mountains to the Siskiyou Mountains.

On February 12, 1959, Senator Engle requested a hearing on the intertie proposal. At the February 16, Senate Interior Committee hearings on Federal Power Marketing Problems, Senator Neuberger called on witnesses who supported the intertie, and endorsed Engle's request for a hearing.

By March 20, 1959, the PG&E-BPA contracts were in draft form ready for signing. The contracts were strongly opposed by Governors Edmund Brown of California and Albert Rosellini of Washington, reflecting the groundswell of public concern along the entire West Coast. Governors Brown and Rosellini and Oregon Governor Mark Hatfield presented their views at the Senate Interior and Insular Affairs Committee hearings April 8-9, 1959. Hatfield asked for a joint feasibility study, and Brown and Rosellini asked that construction of the intertie be delayed until the study was completed. Rosellini also called for legislation to insure each region preference rights for power from its resources.

The Northwest Public Power Association urged construction of two 460,000 volt lines. It presented some interesting documentation of the intertie history from 1935 through 1951 (p. 196-227). It included the Creim speech, correspondence with Congressman Engle, an extensive research memorandum, and a bibliography that chronicled the issues.

On May 19 the Senate Committee passed a resolution requesting Secretary Seaton to hold PG&E's intertie proposal in abeyance until Interior could conduct a study and analyze the feasibility and desirability of an intertie. The report was to be submitted with recommendations by July 15, 1959, later extended to January 1960.

The resulting study and report, submitted in February to the Committee by BPA Administrator Pearl, showed feasibility of a modest intertie with a 200,000 kW capacity.

At Committee hearings on the report May 5 and June 15, 1960, the three Governors requested additional time to study and analyze the intertie and seek protective legislation. The Committee resolved June 21 to ask the Secretary to submit legislation to govern power transactions over any intertie to Congress after the 1960 election.

Meanwhile the three governors had formed the Pacific Coast Governors Power Coordinating Committee and employed H. Zinder & Associates to study the intertie potential. The firm's Seattle office was headed by Sol E. Schultz, BPA chief engineer 1939-1953.

Schultz prepared a preliminary report for Oregon and various memorandums and testimony. He submitted two definitive reports to Governor Brown in September 1960 and January 1961.

Schultz condemned the February 1960 Interior report as too conservative. Schultz earlier had suggested that two 345,000 volt lines be installed. He now recommended at least two 500,000 volt twin-bundle conductor lines from the Columbia River (not Klamath Falls) to Bakersfield, California, so as to include the large southern California market and indirectly electric systems in the Colorado River Basin.

The Schultz report included correspondence with Los Angeles concerning its power needs, and suggested direct-current transmission be provided if technology could be refined. In short, the report expanded the horizon of possibilities in a major manner.

In his February 21, 1961, message on Natural Resources, President Kennedy advised Congress:

"Finally, I have directed the Secretary of the Interior to develop plans for the early interconnection of areas served by that Department's marketing agencies with adequate common carrier transmission lines; to plan for further national cooperative pooling of electric power, both public and private; and to enlarge such pooling as now exists."

Pursuant to this directive, Secretary Udall wrote a memorandum March 10 to establish a task force chaired by BPA Administrator Luce. The task force's December 15, 1961, report outlined alternative interties of up to 2.5 million kW, assuming all parties participated and the Canadian Entitlement was sold in California. The report stated that three 750-kV d-c lines would be the most economical alternative. The second choice was three 500 kV a-c lines, and the third of three 345 kV lines was included as a "poor choice." The task force had adopted the expanded horizons of the Schultz report, and a more optimistic evaluation of the state of the art of d-c transmission. It reviewed the recent history of intertie proposals and recommended early appropriations for planning and initiation of negotiations with utilities involved.

There was some opposition to the intertie concept. In a September 22, 1961, memorandum to the BPA Administrator, the heads of three California utilities voiced objections. The presidents of Southern California Edison, San Diego Gas and Electric Co., and California Electric Power Company contended that a twin circuit EHV line would not be feasible. They agreed, however, to continue meeting with BPA to discuss the subject.

Numerous negotiating sessions followed on the Coordination Agreement, the Columbia River Treaty Protocol, and many aspects of the intertie. Many negotiations were interrelated and interdependent.

Congress appropriated funds in 1962 for a temporary test center for d-c transmission technology. After designing d-c line hardware, the center became permanent as research continued into higher voltages.

BPA and the Los Angeles Department of Water and Power negotiated with ASEA of Sweden and General Electric Company for the 750 kV d-c system. BPA adopted 500,000 volts a.c. for backbone transmission to overlay its 230,000 volt system. Thereupon BPA discontinued the use of 287 kV, 315 kV, and 345 kV, except for existing lines.

In December 1962, EBASCO published a report called "Comparison of Direct and Alternating Current for High-Voltage Electric Power Transmission." It was highly critical of d-c transmission. The main contents of this report were presented as a paper to the 1963 Winter General Meeting in New York of the Institute of Electric and Electronic Engineers. At the same meeting, engineers from ASEA countered that d-c transmission had been proven to be practical under actual operating conditions. A d-c line had been operating since 1954 between Swedish mainland and Gotland and another d-c line since 1961 between England and France. The success of the links was widely touted by BPA.

Regional protection legislation was another area of negotiation. The 1961 bills did not move. The Senate adopted a bill in 1962, but it languished in the House. On April 23, 1963, the Senate adopted S. 1007, which guaranteed electric consumers in the Pacific Northwest first call on electric energy generated at Federal hydroelectric plants in that region and to guarantee electric consumers in other regions reciprocal priority, and for other purposes. On August 27 the House added an amendment sponsored by Congressman Jack Westland of Washington, which prohibited construction of Federal intertie lines outside the Pacific Northwest unless authorized by Congress in separate legislation.

The December 11, 1963, Conference Committee report on the Public Works Appropriations Bill of 1964 requested a report from the Department of the Interior on the proposed Pacific Northwest-Pacific Southwest Intertie. The bill earmarked funds for intertie construction subject to enactment of S. 1007, and negotiation of a plan with benefits equal under Federal and non-Federal ownership to those that would result from all-Federal ownership. Subsequently the "benefits equality" included the right of access to all intertie lines regardless of ownership.

Interior issued its criteria March 11, 1964, with a dual line intertie, one a-c and one d-c, as the Federal yardstick. By April 17 it had received 10 proposals from 12 utilities or entities.

The Canadian Entitlement was becoming a real factor in the considerations, involving over a million kilowatts. Utilities in Phoenix, Arizona, had asked for 100,000 kW of capacity. The inclusion of Arizona in negotiations prompted the California Intertie to be renamed the Pacific Northwest-Pacific Southwest Intertie.

The Department's negotiating team settled on two 750 kV d-c lines and two 500 kV a-c lines at an estimated cost of $700 million, subject to enactment of S.1007. Benefits were estimated at $2.6 billion over 50 years. It was estimated the benefit-cost ratio would exceed 2.5 to 1 and post-amortization benefits would be realized. Negotiations continued, and the plan was amended July 21 and 27, 1964.

Interior Secretary Udall had sent the intertie report to the House and Senate Appropriations Committees June 24. On August 14 Congress approved the Public Works Appropriations Bill of 1965 with $42.2 million for BPA and $3.3 million for the Bureau of Reclamation to construct the Federal portion of the intertie. The bill provided that any wheeling agreement had to be transmitted to the Senate not less than 60 days before its effective date. It also provided that the cost of wheeling Federal power over the privately built portion of the interties could not exceed what the cost would have been if the lines had been built entirely by Federal agencies. The approved four-intertie package had a capacity of 4.7 million kW or 23 times the originally proposed capacity.

Incidental to S. 1007, Congressman Gerald Ford of Michigan argued that Interior and Agriculture Department regulations for transmission line right-of-way on public lands discriminated against private power.

The House and Senate Conference Committee modified the Westland amendment in 1964 to remove the requirement for additional authorizing legislation. S. 1007 cleared the House August 12 and 18, the Senate August 20, and was signed by President Johnson August 31 as P.L. 88-552.

At the Intertie Victory Breakfast, Secretary Udall called attention to President Johnson's personal interest in S. 1007 and the appropriations bill in the crucial hours leading up to their approval:

"...with all the effort of three and a half years of studies, of negotiations, or arguments that went towards the final compromise, I think it should be recorded here that the President himself played a very major role in this... some of us remember two or three meetings in the Oval Room in the President's inner office, where people were told rather directly that if the benefits of this great project for everyone were so good as we were telling him it was, that certainly we could sit down and reason together and we ought to go back and sit down and talk some more. This is what, above all, helped produce this agreement."

It was also at the same Intertie Victory Breakfast that Udall paid tribute to Luce in the words quoted at the beginning of Chapter 27.

The utilities built the two 500 kV a-c lines through the PG&E area to Los Angeles. The 800 kV d-c line was routed through Nevada directly to Los Angeles. Although an October 1964 report deemed the second d-c line to Arizona was feasible, it was not built. It is again being actively considered.

BPA built the 265 miles of the d-c line, 267 miles of one a-c line and 88 miles of the second a-c line in Oregon. Portland General Electric Company built the remaining 179 miles.

The first d-c line was in service in late 1967, the second in late 1968, each with initially 1 million and now 1,250,000

President Lyndon B. Johnson addresses Intertie Victory Breakfast in Portland September 17, 1964.

kW capacity. The 800 kV d-c line with 1,440,000 kW capacity went into service May 1970.

Each of the 500 kV a-c lines lost seven steel towers in northern California in a storm December 17, 1970, but was back in service by January 1971. On February 9, 1971, an earthquake struck and severely damaged the d-c terminal station at Sylmar, California. The d-c system was back in partial operation by March 1972 and in full operation September 5, 1972. On the whole the intertie system has worked well.

Normally the lines are used as planned for the sale or exchange of surplus peaking, surplus secondary, diversity energy and peaking, firming up about 700,000 kW for BPA, and were used temporarily for selling the Canadian Entitlement. Since 1972 the intertie has had unforeseen uses as strikes and other factors delayed construction of new generating plants or providing power when a severe cold spell hit the Northwest.

The working of the West Coast Interties is illustrated in the unusually high water year of 1976 followed by the record low water year of 1977. In 1976 BPA sold in California a record 13.2 billion kWh and received $49.8 million in revenue. This saved California and the Nation 22 million barrels of oil, and at $12.50/bbl, a total of $275 million. In 1977 BPA had no surplus secondary energy, but did provide peaking and other services which resulted in $3.97 million in revenue.

The Pacific Southwest has enjoyed enormous benefits, mainly a net flow of 111 billion kWh of secondary energy from the Northwest. This energy from 1968 to 1976 equalled 186 million barrels of oil worth about $2¼ billion at $12 per barrel. There have been substantial benefits to the California State Water Plan and to the public and private electric utilities in California.

On April 19, 1978, Luce – Chairman of Consolidated Edison Company – returned to the Pacific Northwest to speak at the Reed College Symposium honoring the late Bernard Goldhammer. Commenting on the economics of the West Coast Intertie, Luce noted that the benefits-to-cost ratio has jumped from 2½ to 1 to 11 to 1 even with a rise in the discount rate from 3 to 8 percent. He projected that over the 50-year life, on average, the interties will pay the entire $600 million of the construction cost each year – over and over again each year of their 50-year expected lives.

By any standard the lessons of the interties extend beyond conventional economics and the usual political decision process.

31. GRAND COULEE THIRD POWERHOUSE

And far up the river is Grand Coulee Dam
The mightiest thing ever built by a man
To run the great factories and water the land
It's roll on, Columbia, roll on.

Roll on, Columiba
– Song by Woody Guthrie

So sang Woody Guthrie in May 1941. During 30 days as a BPA employee, he wrote 26 songs about the Pacific Northwest and the BPA program.

The Bureau of Reclamation put Grand Coulee's 18th generator in operation in October 1951, thus completing both powerhouses. It was then the world's largest hydroelectric project.

Yet each summer millions of acre-feet of water thundered down the spillways unharnessed. In the early years five to six times as much water was spilled during high flood peaks as used by all Grand Coulee generators when on full load. The Bureau had to periodically pour tons of concrete in cavitation holes gouged out of the spillway lip by the enormous eroding force of surplus flood waters.

Visitors to Grand Coulee Dam in June saw water crashing over the spillway and were awed by its enormous power. Visitors in December saw a dry spillway as the fully harnessed water ran almost quietly through the turbines. Even then some of the turbines stood idle or operated only to meet peakloads.

Congress appropriated $125,000 in 1952 for a feasibility investigation of a third powerplant at Grand Coulee. The Bureau drew plans for both a third and a fourth powerhouse. The plans had to wait for development of upstream storage to capture flood waters and hold them for release in winter when power needs were the greatest.

The full 2,980,000 acre-feet of usable storage in Hungry Horse Dam became available by the fall of 1954. This increased the prime power capability of Grand Coulee's 18 generators from 1,117,000 kW to 1,280,000 kW. By 1962, the total prime power contribution of Hungry Horse at site and at downstream projects was 840,000 kW. Hungry Horse helped illustrate and prove the importance of upstream storage.

Ten years went by. The only significant gain in upstream storage was the modest 1.1 million acre-feet at Albeni Falls. Ratification of the Columbia River Treaty revived the third powerhouse idea. The prospective gain of 15.5

million acre-feet of usable power storage at the three Treaty dams would make possible an initial 2.8 million kW increase in downstream benefits. Further gains would be realized on completion of Libby Dam with 5 million acre-feet of storage. Treaty benefits were premised on the installation of more generators at all downstream dams, including Coulee. There were additional important reasons for adding a large third powerhouse at Coulee. The Pacific Northwest-Pacific Southwest Interties would provide a substantial new market for peaking power. Continuing load growth within the Pacific Northwest and installation of thermal generation would require more hydro peaking capacity. Studies indicated Grand Coulee could most economically provide the new peaking capacity.

The Bureau of Reclamation study in January 1965 recommended a third powerplant containing twelve 300,000 kW units. Senator Jackson was joined by other members of the Pacific Northwest delegation in Congress in sponsoring authorizing legislation and enlisted President Johnson's support. The Senate hearings went well. Indicative of new political order along the West Coast, some of the strongest support and testimony for the third powerplant came from electric utilities in southern California and congressional members from California. Although Grand Coulee was a thousand miles away, the third powerhouse could provide California valuable, yet low-cost peaking power and reserves via the interties. The Senate Committee Report 314-99/1 of June 10, 1965, said that the purpose of the third powerplant at Grand Coulee Dam

"...is to meet the growing power needs of the Northwest, to provide additional peaking power for the Southwest, and to enable the United States to take full advantage of the additional water storage that will be available as a result of the new Canadian Treaty..."

Wayne Aspinall, House Interior and Insular Affairs Committee chairman, said he would support the bill if it included a basin account for the irrigation subsidy. Discussions toward a compromise continued for almost a year. This issue led to the pooling of revenues from all Federal hydroelectric dams in the Pacific Northwest. This finally required two bills.

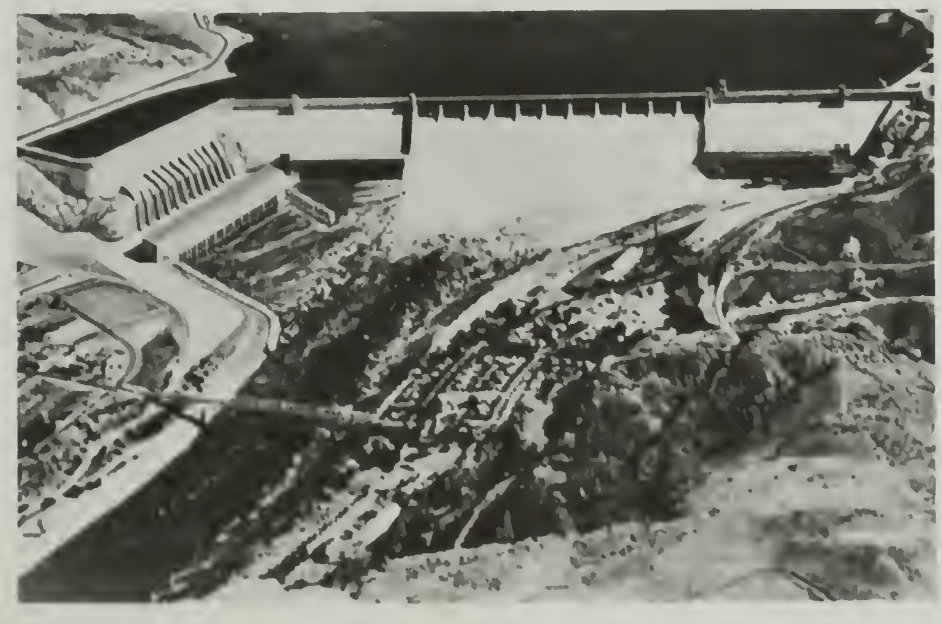
The Grand Coulee Third Powerplant legislation President Johnson signed June 14, 1966, authorized both the irrigation basin account and the consolidated financial statement or power repayment plan. The bill signed September 7 defined ground rules for the irrigation account.

Although the Secretary of the Interior had approved the systemwide power payout plan concept April 3, 1965, the June 1966 Act adopted the 1965 plan revision as law. The revision was the basis for BPA wholesale rate revisions December 20, 1965.

The consolidated financial statement has appeared in each BPA annual report since 1965. It permits BPA to use power revenues from older dams, after completing their 50-year repayment, to pay off investments in newer dams. The annual BPA payout study has resulted in other improvements in the ground rules. For example, instead of requiring that reserves be set aside to finance replacement of transmission and powerhouse facilities, the new rule permits the investment in replacement or additions to be repaid over their useful service life, beginning after they are placed in service.

The irrigation basin account applies to all Federal investment in irrigation projects in the Pacific Northwest including isolated projects not associated with Federal power dams. Irrigation subsidy payments are to be made from power revenues beginning in 1997 and limited to an average of $30 million per year after that date.

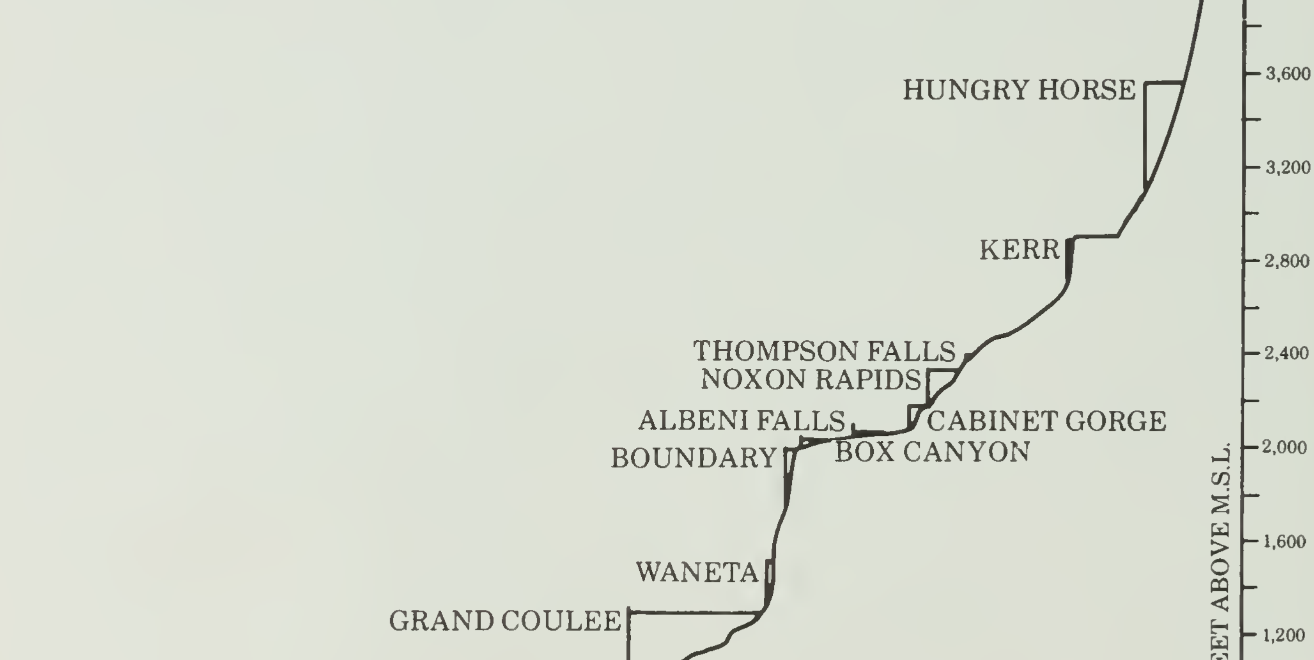
Construction on the Grand Coulee Third Powerhouse began in 1967, after the plan was revised to three 600,000 kW generators and three 700,000 kW generators, for a total of 3.9 million kW, plus 100,000 kW of pump generators at the Grand Coulee Pumping Plant for irrigation. The 18 old Coulee generators were rewound for a gain of 17,000 kW each. This, plus the third powerhouse, gave Grand Coulee a total capacity of 6,180,000 kW. The plan permits installation of an additional six units at the third powerhouse to raise Coulee's peaking capacity to more than 10 million kW. This now, however, is considered conjectural; a lesser number may be installed.

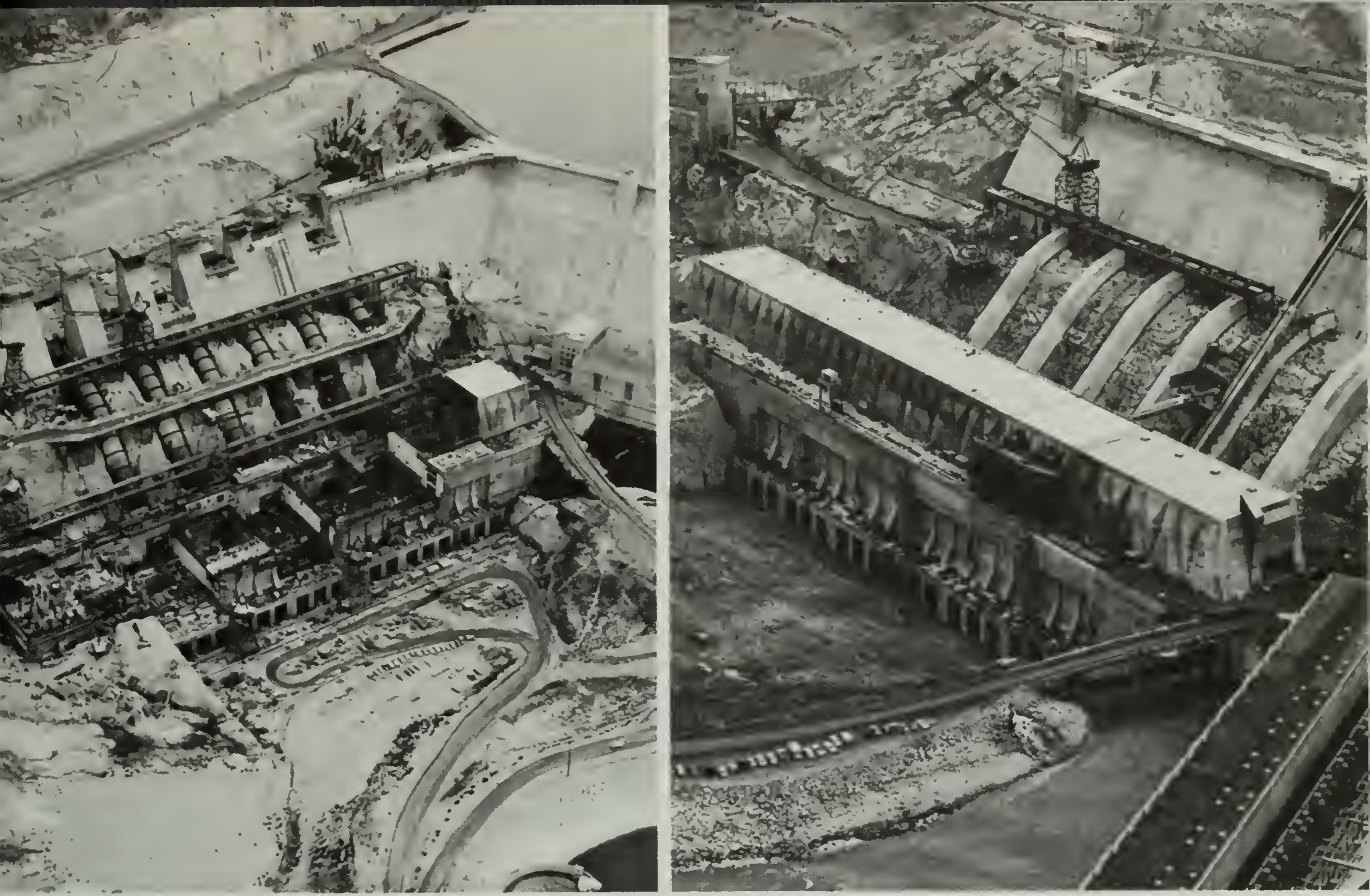


Grand Coulee third powerplant shown in operation.

PROFILE OF ULTIMATE POWER HEAD AT PROJECTS DOWNSTREAM FROM HUNGRY HORSE RESERVOIR

ON FLATHEAD, CLARK FORK, PEND OREILLE AND COLUMBIA RIVERS





Construction progress at the Third Powerplant at Grand Coulee Dam.

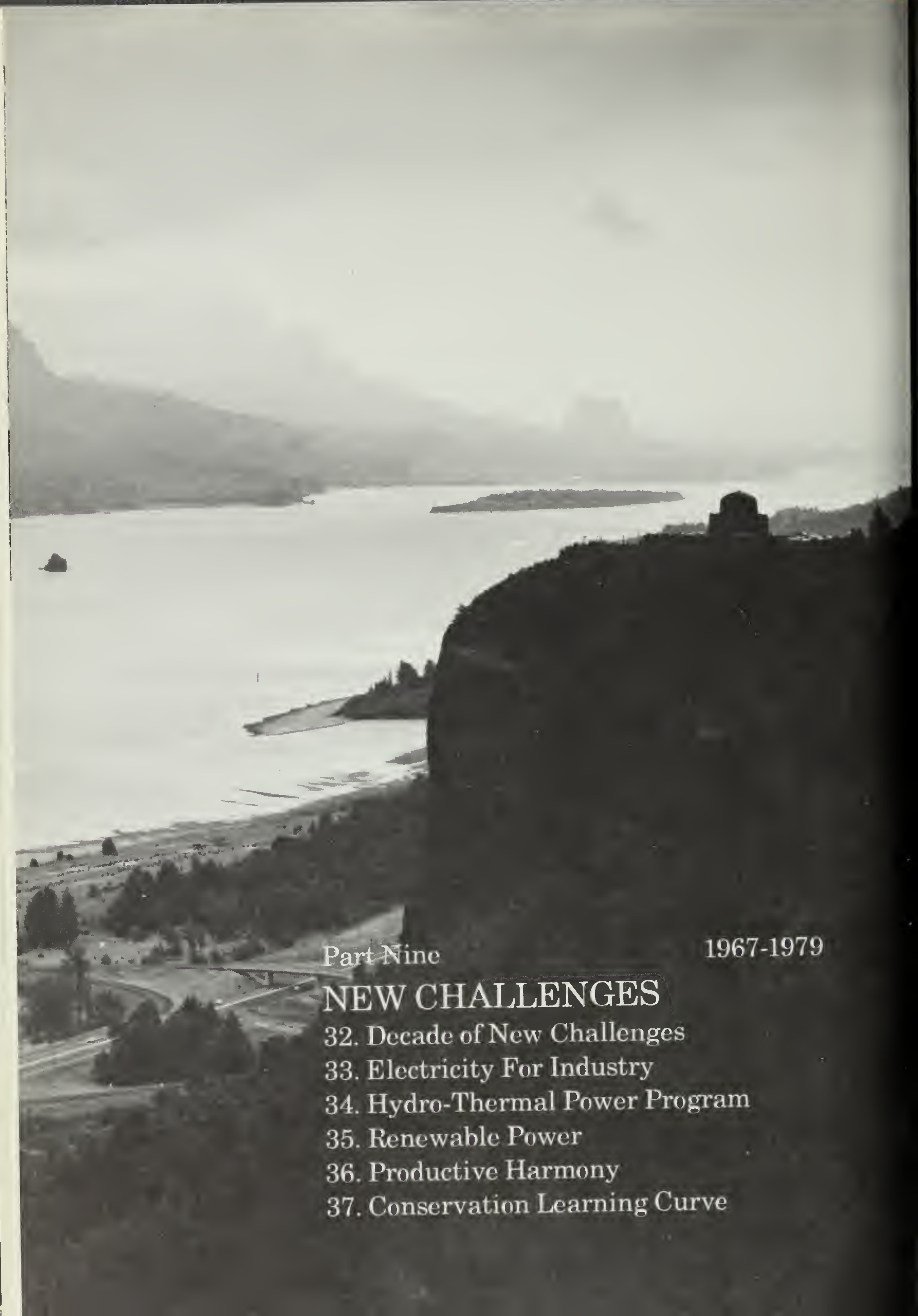
On October 11, 1975, hundreds of people gathered for another in the long series of Grand Coulee celebrations. The first 600,000 kW generator in the third powerhouse, unit 19, was ready to go into operation. It stood 180 feet high. The 77-foot diameter generator rotor was driven by a 32-foot diameter water wheel as 30,000 cfs of water rushed down through a 40-foot diameter penstock to rotate the massive 2,200-ton unit. It was "the mightiest thing ever built by a man."

As construction proceeded on the interties and the third powerhouse, Congress authorized a second powerhouse for Bonneville Dam and studies for a second powerhouse at McNary Dam and appropriated funds for additional generators at other downstream Federal dams. This construction continues today.

The Grand Coulee Third Powerhouse legislation set common ground rules for all Federal power and irrigation projects in the Pacific Northwest. It involved the Columbia River Treaty, the Interties, the Coordination Agreement, and the many additional downstream generators. It was the capstone of the Luce program and era.

The Luce program was prodigious and prolific. He cleared the BPA agenda of proposals and issues that had remained unsettled for 10 to 15 years. Compromises were made but the job was done.

Luce's performance and accomplishments as BPA Administrator were monumental. He expanded the power horizon from British Columbia to Mexico.



Part Nine

1967-1979

NEW CHALLENGES

32. Decade of New Challenges
33. Electricity For Industry
34. Hydro-Thermal Power Program
35. Renewable Power
36. Productive Harmony
37. Conservation Learning Curve

32. DECADE OF NEW CHALLENGES

"There was a time when meadow, grove, and stream,
The earth, and every common sight
To me did seem
Apparell'd in celestial light,
The glory and the freshness of a dream.
It is not now as it has been of yore;–
Turn wheresoe'er I may,
By night or day,
The things which I have seen I now can see no more!

* * * *

"Whither is fled the visionary gleam?"
Where is it now the glory and the dream?"

– William Wordsworth
Ode on Intimations of Immortality
from Recollections of Early Childhood

On August 20, 1977, the Bonneville Power Administration quietly passed its 40th birthday. The subdued observance reflected the cumulation of problems making up the worsening power supply outlook that set in from 1966 through 1979, somewhat more than a decade.

The historical period challenged the Nation and the region. Many authors took turns styling the period as half-bad or half-good. William Manchester saw a downward trend in his 1974 book *The Glory and the Dream* tracing 40 years of American history from the high hopes engendered by Roosevelt's New Deal in 1933 to the 1974 disillusionment of Watergate, which led him to ask "where is it now the glory and the dream?"

A calmer view of recent history appeared in the autobiography of Louis Brownlow, outstanding administrator and advisor to Franklin Roosevelt. Of his changing perceptions of events and decisions in his time and career, Brownlow wrote,

"Periods of time have three lives. They are 'crucial' to those who are involved in their making; 'everyday' to those who are living them; and 'history' to those who, years later, delve back into them."

At least the times called for a quiet determination to find new solutions to new problems. Even for an agency long accustomed to coping with one crisis after another, this proved to be a decade of new challenges.

National Trends. On the national scene probably the two main trends of the Bonneville decade that started in 1967 were the upsurge in environmental awareness and the upsurge in energy awareness, and, competition between

View of the Columbia River Gorge looking eastward with Oregon's Vista House in the right foreground and Beacon Rock on the horizon.
Ray Atkeson photo

the two for greater attention. Both subjects resulted in a flurry of new laws. During this period both national and regional events and trends had major influence on BPA and the Pacific Northwest power situation and outlook. These events and trends made up the historical setting and climate for the next five chapters on electricity for industry, the Hydro-Thermal Power Program, renewable power sources, the environmental considerations, and the imperative of energy conservation.

Continued U.S. involvement in the Vietnam conflict brought on national disharmony, public disenchantment, and record Federal budget deficits that doubled the national debt, and, incidentally, served to discourage building Federal hydroelectric projects. Side effects of the Federal deficit problem included a rise in interest rates coupled with rising prices and inflation. The winding down of the Vietnam conflict helped swell the ranks of the unemployed.

The fourth Arab-Israel war, the Yom Kippur war, erupted October 6, 1973. Ministers of the Organization of Petroleum Exporting Countries (OPEC) met October 17 at Kuwait and agreed to cut oil exports and increase oil prices 17 percent and taxes 70 percent. During October 19-21 most Arab countries agreed to an embargo. The oil embargo created an international energy crisis, and rising oil prices accentuated general inflation. The United Nations obtained a cease-fire October 24, but the embargo persisted until March 18, 1974. Oil prices continued to rise.

The recession of 1974-76, worst since the early 1930s, was marked by both high unemployment and rising inflation. Many economists debated over which problem was worse, unemployment or inflation, with the result that little was done about either, which didn't help in Gerald Ford's election efforts in 1976.

Another unfruitful debate of the period, that likewise split liberals and conservatives, concerned the approach to solving the energy problems. Conservatives called for more oil and natural gas production to be stimulated by a further incentive of subsidies and higher prices, while liberals argued energy conservation could solve the problem. While the debate continued year after year, the volume of foreign oil imports increased and the deficits in the balance of trade and balance of payments passed the $45 billion per year range, causing more inflation.

National politics reflected the debates and the public unrest. President Lyndon Johnson fell victim to a credibility gap resulting from his handling of the Vietnam conflict. In early 1968, he decided not to run for reelection. That fall

Republican Richard Nixon edged Hubert H. Humphrey 31.8 to 31.3 million votes, and George Wallace drew 9.9 million votes in the November 5, 1968 election. Nixon won 301 electoral college votes, Humphrey 191, and Wallace 46. Despite some Republican gains, Democrats continued to control Congress with majorities of 243 to 192 in the House and 58 to 42 in the Senate. Republicans held 31 governorships, dropping one when Spiro T. Agnew resigned as Governor of Maryland to be Nixon's running mate, and a Democrat replaced him.

The 1970 elections were a standoff. Democrats gained slightly in the House with a majority of 254 to 180, and lost slightly in the Senate with a majority of 54 to 44. In 1972 the voters elected the 93rd Congress with 239 Democrats and 192 Republicans in the House and 56 Democrats, 42 Republicans, and 2 others in the Senate. Nixon won reelection with 47.2 million votes to George McGovern's 29.2 million, and an electoral vote of 520 to 17. The bungled burglary of Democratic headquarters in the Watergate office building occurred June 17, 1972. Following the revelation of the Watergate tapes July 16, 1973, Nixon purged the White House staff October 20. Vice President Agnew resigned October 10, 1973. Gerald Ford became Vice President December 6, 1973.

Watergate dominated the news through most of 1974. On July 30, the House Judiciary Committee recommended impeachment. Nixon resigned effective noon August 9. Vice President Ford became President. That fall the Democrats made strong gains. The 94th Congress had 286 Democrats and 145 Republicans in the House and 68 Democrats and 32 Republicans in the Senate.

The November 1976 election favored Jimmy Carter over Gerald Ford 40.17 to 38.43 million votes, and 297 to 241 electoral college votes. The 95th Congress had 289 Democrats and 143 Republicans in the House and 62 Democrats and 38 Republicans in the Senate. Throughout the decade Democrats controlled both houses of Congress.

Two events occurred during President Nixon's first two years that directly affected BPA. First, on the recommendation of Secretary of the Interior Walter Hickel, Nixon on October 27, 1969, approved the Hydro-Thermal Power Program. It was implemented by Congress in subsequent Public Works Appropriations Acts. Second, Nixon signed the National Environmental Policy Act on January 1, 1970. NEPA's principal sponsor was Senator Jackson. Administrator Sterling Munro, Jackson's principal staff assistant, had a large hand in the staff work.

President Nixon sent a message to Congress June 4, 1971, on "A Program to Insure an Adequate Supply of Clean Energy in the Future." It was the first time in the Nation's history any President sent Congress a message devoted entirely to energy. It called for more production, more energy research, and reorganization of Federal energy activities.

Nixon sent Congress his second and more urgent energy message April 18, 1973. More energy messages followed.

On June 29, 1973, Nixon announced that he was launching a study for a 5-year $10 billion energy research and development program to be headed by Dr. Dixy Lee Ray, Atomic Energy Commission Chairman. The December 1, 1973 report to the President called for an $11 billion, 5-year energy research and development program. She listed conservation research as the top priority, earmarking $1.44 billion for finding ways to reduce waste and increase efficiency. It was significant that this recommendation gave conservation top priority, and that it cited the need for considerable research on conservation, the need to get started on a new and fundamental conservation learning curve. The report, "The Nation's Energy Future," recommended energy self-sufficiency by 1985. There was not, at the end of the decade of the '70s, as much optimism as earlier about the goal of energy independence, and the targets for each year are being set on the basis of an annual review. Congress readily approved Ray's proposed budgets, including a 1975 energy R&D budget double that of fiscal year 1974.

On October 18, 1974, President Ford signed the Federal Columbia River Transmission System Act. It gave BPA self-financing authority, provided financial flexibility, but also increased the interest rate on BPA borrowings.

On December 31, 1975, President Gerald Ford signed Public Law 94-199 creating the Hells Canyon National Recreation Area and deauthorizing the Asotin Dam.

Five men served as Secretary of the Interior during this period. Udall left in early 1969. Hickel, former Governor of Alaska, left after two years. Rogers C.B. Morton followed,

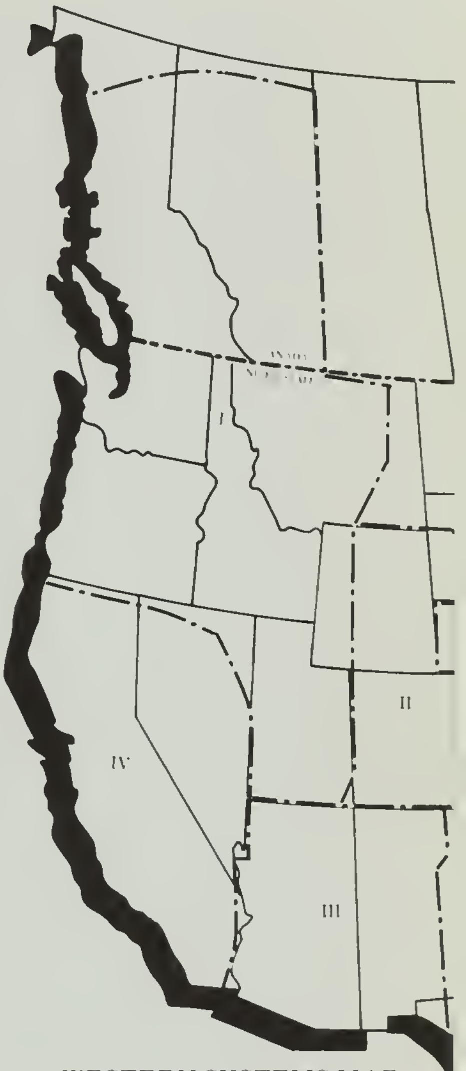
Duncan Dam in Canada, one of the Treaty projects.

and in turn was succeeded by Thomas S. Kleppe. President Carter appointed Cecil Andrus of Idaho. On October 1, 1977 BPA was relocated from the U.S. Department of the Interior to the Department of Energy (DOE), ending a 40-year temporary sojourn in USDI.

Northwest Power Outlook Worsens. Turning to the Pacific Northwest is much like looking in a mirror because so much of the national picture is reflected at the regional level particularly with respect to energy and the environment.

The 1970 census recorded population gains for each State in the Pacific Northwest, particularly Washington which increased 19.5 percent to 3,409,169, and Oregon 18.2 percent to 2,091,385. In the House reapportioning, California gained 5 seats, raising it to 43, and New York lost 2, dropping it to 39. California's delegation constituted 10 percent of the House.

Before introducing the new administrators, it should first be said that the Luce era, 1961-1966, represented a peak in BPA progress. BPA had cleared a lot of old business. It entered its fourth decade with considerable momentum, confidence, and optimism. New initiatives had provided an agenda for years to come and raised BPA to a higher and broader plateau of activity. Congress had authorized the Columbia River Treaty, the West Coast Interties, and the Grand Coulee Third Powerplant. The Treaty Protocol presupposed that many additional generators would be installed at all Columbia River dams over a 20-year period.



WESTERN SYSTEMS MAP

GENERAL LOAD AREAS
I Northwest Power Pool Area
II Rocky Mountain Power Area
III Arizona New Mexico Power Area
IV California Nevada Power Area

David S. Black. David S. Black, an attorney born in Everett, Washington in 1928, was the first of four Administrators during the 1966-1979 period. He was appointed BPA Administrator on August 31, 1966, leaving his Kennedy-appointed post as a Federal Power Commissioner to succeed Luce who had become Under Secretary of the Interior. He served only a year before succeeding Luce again, this time in the Under Secretary's post.

David S. Black

After BPA's Advance Program was issued in October 1966, Administrator Black took steps to facilitate construction of non-Federal thermal powerplants by helping form the Joint Power Planning Council, comprised of 109 public and private utilities and BPA. The first of the Treaty projects, Duncan Lake, went into service in July 1967. Hanford had gone into full service late in 1966. In anticipation of completion of the first 500-kV intertie, Black had participated with representatives of West Coast electric utilities in forming the Western Systems Coordinating Council. Black resigned September 7, 1967, to become Under Secretary of the Interior when Luce left the post.

Henry R. Richmond

Henry R. Richmond. Henry R. Richmond became the first BPA employee to rise through the ranks to head the agency. He joined BPA in 1941, and became Walla Walla Area Manager in 1952. He resigned in 1954 to go into private business in California. Administrator Luce brought him back to BPA in February 1963. He became Deputy Administrator in January 1966, Acting Administrator in July 1967, Administrator October 20, 1967, and retired from Federal service five years later on November 30, 1972.

While some people assumed in 1966 that the region had exhausted its hydro resources, the ensuing decade required $3 billion in Federal appropriations to install generators and transmission lines. BPA annual reports show that total Federal investment in dams and transmission facilities increased from $3.44 billion to $7.15 billion in the decade July 1, 1966 to June 30, 1976. This increase was greater than the total investment from 1933 to 1966. The power portion more than doubled from $2.3 to $5.35 billion, and the transmission portion nearly tripled from $673 million to $1.719 billion. Generating nameplate capacity doubled from 6.678 million kilowatts to 13.617 million. Operating revenues almost tripled from $103 million to $297 million per year.

BPA planning changed substantially after 1965. Under a Bureau of the Budget directive, advance programs in the 1940s were projected six years. This standard for capital budgeting had been recommended by the National Resources Planning Board. Six years also was the normal construction period for large dams. The Corps of Engineers, however, had pointed out that realistically 11 years were required to seek and obtain authorization (more recent Corps estimate is 20 years), do preconstruction planning, and build a dam. In view of this, BPA in 1955 changed to a ten-year advance program.

In 1965 Congress enacted the Water Resources Planning Act which created the Water Resources Council. The Council set 1970 to 2020 as its 50-year planning period. Meanwhile, difficulties in locating thermal generating plant sites and obtaining approvals, and the complexity and scale involved in building million kilowatt plants, led BPA in 1967 to adopt a 20-year period for making electric load forecasts. FPC and other agencies also changed nationwide to a 20-year planning basis. These longer term projections demonstrated the need for many more large plants costing billions of dollars.

The reaction to this was strong, particularly among environmental groups. They challenged load growth assumptions used in projecting the need for new resources. The 20-year electric power projections came under attack as did similar power projections nationwide. Utilities were accused of over-forecasting. The assumption that the demand for energy would continue to increase at traditional rates came under scrutiny at all levels. Moreover growth rates were declining somewhat anyway.

For several years Richmond had coordinated the area managers. Luce had strengthened the area manager system, a decentralized management policy Richmond strongly supported and facilitated. In his more than five years as Administrator, Richmond forged the Hydro-Thermal Power Program in 1968, which is discussed in Chapter 34. HTPP was approved by Congress and subsequently signed by President Nixon on October 27, 1969. Richmond reestablished BPA's Divison of Operations and Maintenance. Throughout his time as Administrator, 1967-1972, Richmond performed a difficult job of keeping BPA afloat in a time of reduced national support, slowdown in construction of dams, a tightening power situation.

Donald Paul Hodel. Donald Paul Hodel was born in Portland in 1935. He graduated from Harvard, and then, in 1960, from the University of Oregon School of Law. He became Deputy Administrator October 1, 1969, and Administrator December 1, 1972. He resigned effective December 31, 1977, after serving five years.

His term of office was highlighted by the completion of the Pacific Northwest-Pacific Southwest Interties and initiation of studies for two more interties, dedication of Dworshak and Libby Dams, construction of the Grand Coulee Dam Third Powerplant and Dittmer Control Center, and completion of the Columbia River Treaty projects. He led the effort to persuade Congress to enact the Federal Columbia River Transmission System Act of October 18, 1974. Secretary of the Interior Rogers C.B. Morton in March 1974 presented Hodel with the Department's Outstanding Service Award for his prompt organization of an energy conservation program in response to the 1972-73 low water year.

Donald P. Hodel

Hodel supported research both at BPA and by participation as a member of the board of directors of the Electric Power Research Institute (EPRI). The Lyons, Oregon, UHV Test Facility, built at a cost in excess of $10 million, was authorized in 1974 and dedicated in September 1977 to test 1,200,000 volt a-c transmission. The Moro Mechanical Test Line serves as a companion facility to observe physical characteristics such as ice and wind loading. UHV, ultra high voltage, refers generally to voltages above 800,000 volts.

In 1972 and 1973, discussions among the Office of Management and Budget, the Domestic Council, and the Department of the Interior led to a decision to have the BPA Administrator explore the possibilities of a plan to put BPA on a Treasury bond financing basis. The result was the enactment by Congress of the Federal Columbia River Transmission System Act of October 18, 1974.

Phase II of the Hydro-Thermal Program began auspiciously in December 1973 as the regional utilities reached a consensus. Two challenges in court in 1975 stopped any BPA participation in Phase II until after completion of a comprehensive environmental impact statement on the BPA role in the regional power supply system. It was to take more than four years to write and obtain the necessary departmental approvals for the big environmental impact statement that became known as the "Role EIS."

The 1974 Act was in part an outgrowth of the Hydro-Thermal Power Program and in turn was intended to facilitate Phase II by assuring that the Federal Government would participate to the extent of providing needed transmission. President Nixon's 1969 approval of Phase I had confirmed a continuation of the participation policy.

In his annual reports, Administrator Hodel concentrated on some hard realities. The 1973 report announced the end of an era of cheap, abundant power. Although BPA continued to remain in the black on a cumulative basis, two successive years of financial deficits led to a 27 percent increase in BPA wholesale power rates effective December 20, 1974. The 1976 report stated bluntly,

> "Forecasted energy shortages, protracted litigation, lack of a consensus plan for meeting future energy requirements – all of these combine to create concern over the power picture in the Pacific Northwest."

Construction delays, for thermal plants the region's utilities had scheduled to augment hydro, was the principal reason for the serious electric power shortages in 1977 and 1979 and which set the stage for potential serious shortages in every year throughout the decade of the 80's. But it was low streamflows that caused the region's first severe power shortage in 1973.

In mid-1973, just before the oil crisis, the Pacific Northwest experienced lower than critical water year streamflows for a large part of the year. BPA and Northwest Governors instituted a crash energy conservation program. The Northwest hydro shortage had been aggravated by the budgetary slippage for dams and generators. December rains eased the hydro crisis, but gasoline and oil shortages continued into the spring of 1974.

Although the region enjoyed better water years in 1974, 1975, and 1976, Administrator Hodel tried to keep alive the idea of energy conservation but it required another severe drought in 1977 coupled with more construction delays to rekindle the conservation idea. The public again re-

Panorama Point near Hood River, Oregon where BPA designed its transmission structures to be compatible with this scenic overview point.

sponded favorably at the time, but the problem of how to sell and sustain energy conservation remained.

A long-term impetus for conservation was provided when Hodel on June 24, 1976, issued the required notice of insufficiency. BPA power sales contracts with preference customers had long included a BPA assurance that timely notice would be provided when BPA foresaw a shortage of firm power. The 1976 notice stated that after June 30, 1983, BPA would not be able to serve new load growth of its preference customers.

Frustration dominated the closing year of the Hodel Administration. Hodel's hands were tied by the U.S. District Court order while the environmental impact statement was being written and rewritten. Under the circumstances, the customers of the Administration, lead by the Pacific Northwest Utilities Conference Committee (PNUCC), undertook to draft legislation to provide for a more viable regional power program. After a long series of meetings in 1976 and well into 1977, the effort resulted in the introduction, at PNUCC request, of the Jackson-Meeds bill on September 9, 1977, and prompt holding of ten hearings. The complex bill did not win unanimous approval, and was laid aside at the end of the year with the explanation that a consensus had not yet been achieved.

S. Sterling Munro

S. Sterling Munro. On January 3, 1978, Sanford Sterling Munro, Jr., became Administrator of the Bonneville Power Administration. Born in Madison, Wisconsin, March 2, 1932, he was graduated from high school in Bellingham, Washington, received his B.A. in political science and journalism in 1957 from George Washington University in Washington, D.C., and studied law two years. In 1953 he joined the staff of Senator Henry M. Jackson, and headed the Senator's office as administrative assistant from 1961 to 1975. He then moved to Wenatchee and became a consultant.

Munro brought to his position at BPA a quarter century of legislative experience and familiarity with BPA programs. He decided at once to concentrate on BPA's external relationships, and proceeded to contact the four Pacific Northwest Governors and other leaders and groups throughout the region. Mainly, he focused on the region's faltering power programs, and on forging a consensus on the elements of such a program for inclusion in a new legislative proposal for consideration by Congress.

By mid-1978, Chairman Henry M. Jackson of the Senate Committee on Energy and Natural Resources took charge of the legislative redrafting. First he directed the development of 12 principles for legislation and obtained approval for these principles from his Committee. Then the Committee staff drafted the bill which he and the co-sponsors introduced August 16, 1978, as S.3418 and by Representative Lloyd Meeds and others as H.R. 13931. Ten additional days of hearings were held, numerous amendments were proposed, and the bill died when the 95th Congress adjourned.

On April 5, 1979, Senators Jackson, Magnuson, Church, Hatfield, McClure, and Packwood reintroduced the bill, without amendments, as S.885. After further hearings and Committee sessions for markup, S.885, as amended, was reported to the Senate (Report No. 96-272) on July 30 and passed by the Senate on August 3, 1979. The purpose of the bill is set forth in the title:

> "To assist the electrical consumers of the Pacific Northwest through use of the Federal Columbia River Power System to achieve cost-effective energy conservation, to encourage the development of renewable energy resources, to establish a representative regional power planning process, to assure the region of an efficient and adequate power supply, and for other purposes."

In the House, the identical, original S.885 was introduced April 5, 1979, by Representative Al Ullman of Oregon and 11 Pacific Northwest co-sponsors as H.R. 3508. On May 21, Representative James Weaver of Oregon introduced H.R. 4159, a revision of his previous bill. On August 2, 1979, Representative Ullman introduced the revised S.885 as passed by the Senate except for two amendments, sections 7i and 6m, which were added on the Senate floor before passage on August 3, 1979. Further hearings were held by the two House committees having jurisdiction, but the bill was then laid aside in November 1979 for further consideration in calendar year 1980.

In addition to the continuing drive for regional power legislation, Munro had other concerns, or perhaps other aspects of the same overall concern for power supply.

After two years' effort by a large staff, the environmental impact statement on BPA's role in the regional power system was issued as a 3,000-page draft on July 22, 1977. A 150-day period was allowed for comments. After two more years of effort, the revised BPA Role EIS draft was submitted in July 1979, corrected as requested, and resubmitted October 2, 1979. It was finally approved and filed early in 1980.

Another large effort since the 1974 wholesale rate change was that of preparing for the 1979 rate increase, including preparation of cost of service studies, environmental statement, and many special analytical papers.

Major new costs related to the WPPSS thermal plants. On December 20, 1979, BPA put into effect the largest rate increase in its history. Combined with anticipated increases in wheeling rates, the wholesale power rate increase was designed to increase BPA revenues by 88 percent.

Allocation of power presented a new challenge for BPA. In connection with the notice of insufficiency of June 24, 1976, BPA and its customers recognized the need for a formula for allocating power. Studies began in 1978, and a draft of a proposed policy was issued October 1979 for comment. Munro kept emphasizing how much he'd rather have enough power to go around than to try to divide up a shortage equitably. He lamented and sought to alert the region to the seriousness of the shortages ahead and the need to use every means available, especially conservation and renewable resources, to stretch out the existing power supply.

From his first week on the job in January 1978, Munro heard about the repeated delays and cost overruns on the nuclear plants being built by the Washington Public Power Supply System. He ordered an investigation by an outside consultant. The Washington Legislature also began studies into WPPSS performance. The power supply problem remains, and in 1980 there was no certainty that there would not be more delays in WPPSS plants and more cost overruns.

The latest annual edition of the BPA publication *Power Outlook* of May 1980 for the decade through the 1990-91 operating year is the most comprehensive and realistic picture for the period ahead. It reflects the March 27, 1980 announcement of the further delays for the five WPPSS nuclear plants ranging from 12 to 18 months. It shows a 44-month delay for Skagit Nos. 1 and 2, and a 63-month delay for Pebble Springs Nos. 1 and 2, which shifts completion of these four plants to the period 1990 to 1994. Assuming no further delays, the extent of the shortage under critical hydro conditions ranges from 2,000,000 kilowatts in 1980-81 to 4,000,000 kilowatts in 1990-91.

One aspect of these delays, inevitably, is the increased cost. For example, each day's delay in a nuclear powerplant at 1980 price levels could add a million dollars to the unit's cost. On May 19, 1980, BPA advised its customers that the outlook for the July 1, 1981 rate increase will be about 50 percent in the wholesale cost of power. At that, the full impact of thermal costs was only beginning to be felt.

The next five chapters amplify the issues of BPA's fourth decade, the new challenges of the 1970s.

33. ELECTRICITY FOR INDUSTRY

Figuratively, nearly every Canadian has the miracle of an 'electric horse' at his command to help him do his work, to light his way, to chill or cook his food, to power his machine, to drive his tram or train, to bring him music, video, and entertainment, to turn night into day, and do a thousand and one things with incredible speed and efficiency. The miracle of electricity has made possible our relatively high standard of living and the tremendous development of the past half century. It has sired our huge pulp and paper, aluminum, chemical, electrical industries, atomic research, and so on. Its magic has opened the wilderness and caused great towns and industries to rise where tiny villages stood. More than any one material factor, abundant electric power has made Canada industrially great and helped immeasurably to preserve us against aggression.

"Central Electric Stations 1950"
Issued by Mr. C. D. Howe
Minister of Trade and Commerce
of the Government of Canada

Many similar quotations of the 1935-1960 period attest to the widespread belief in the cause-and-effect relationship between energy and industrialization, between energy and jobs, energy and productivity, energy and gross national product, energy and the standard of living, and indeed between energy and the progress of civilization.

As previously mentioned in Chapter 17, BPA formulated an industrial sales policy in the 1938-1953 period. The public envisioned low-cost power as a tool for industrial and regional development. Senator Richard L. Neuberger called low-cost power the spigot of progress; when it is turned on, the economy flourishes; when it is turned off, the economy withers. World War II and the imperative need for aluminum led BPA into a long-term commitment to that industry.

A New Industrial Revolution. In the last two decades industrialized countries have experienced a new industrial revolution revolving around the sophisticated technologies of electronics, computers, plastics, rare earths, synthetics, alloys, nuclear science (now a source of energy), automation and cybernetics. Industry seeks suburban or rural environments surrounded by attractive landscaping. White collar workers predominate.

Some analysts talk about the post-industrial society. Harvard University Professor of Sociology Daniel Bell has written extensively on the concept of a post-industrial society mainly to reflect the shift in employment from blue collar to white collar workers. In 20 years the composition of U.S. nonagricultural employment has reversed from a 60-40 mix of blue collar and white collar workers to 40-60. The turning point occurred in 1956, and the prediction is that by 1980 U.S. non-agricultural employment will be 70 percent white collar and only 30 percent blue. Meanwhile, U.S. agricultural workers have fallen to about five percent of total employment, attesting to the remarkable efficiency of American agriculture. More time off from work has increased leisure time and helped to create a vast recreation industry, as well as a boom in artistic, cultural, and civic endeavors.

Public perception is changing as to what constitutes basic, essential employment. An early poster of the Patrons of Husbandry, the National Grange, pictures the yeoman farmer above the motto, "I pay for it all." The farmer is portrayed as the foundation of the whole economy: those employed in industry, commerce, government, medicine, education, and other services. He feeds them all. In a similar vein the Chamber of Commerce of the United States claims that each new job in industry brings into the community at least one added job in services. They see the blue collar worker as the producer, all others as hitchhikers. People no longer believe such self-serving publicity. Many kinds of jobs are essential to a modern society. Moreover the American and Pacific Northwest sense of values, goals, and priorities has often changed and will continue to do so. Specifically in point is the growing shift from an emphasis on economic goals toward a larger concern for social and environmental goals.

In 1971, Whitman College commencement speaker Dr. Kenneth Culp Davis referred to our changing priorities and sense of values when he divided the 20th Century into three periods. The first third of the century emphasized engineering values and viewpoints from the building of the Panama Canal to Hoover Dam and the election of a great engineer, Herbert Hoover, as President. The second third of the century focused on economics, beginning with the efforts of President Franklin Roosevelt to overcome the depression and to "depression-proof" the economy. The concept of Gross National Product and many economic indicators resulted, often through the efforts of the Council of Economic Advisors established in 1946.

The last third of the 20th Century, the speaker predicted, would unfurl a sense of social values, a "social report" as suggested by John Gardner, and perhaps a Council of Social Advisors. By the year 2000, social values would be on a par with or be more important than economic values. It would indeed be a post-industrial world. President Nixon's

1971 report on national goals identified some of the social values of concern: notably, a better environment, better health care, education, consumerism, and better assessment and control of technology.

Tudor Limits Sales to Industries. By 1953 with the advent of the Eisenhower Administration, the industrial sales policy was taken away from BPA. First, Under Secretary of the Interior Ralph Tudor ordered BPA to stop promoting new industrial power sales. He felt the agency should confine itself strictly to selling the surplus power. Second, Assistant Secretary Fred Aandahl ordered Raver to give the private utilities of the Pacific Northwest 20-year contracts for substantially all firm power above the needs of preference customers and existing firm power contracts. These contracts expired in 1973 and were not renewed as there was no power available for renewal after taking into account growing loads of public bodies and cooperatives and the industrial loads contracted for in the 1961-66 period. In the meanwhile, the private utility 20-year contracts of 1954 had the intended effect to limit new, direct-service, industrial power sales. Two exceptions were the Harvey Aluminum plant at The Dalles and the Hanna Nickel plant at Riddle, Oregon. They had applied for power earlier and were able to go ahead. The new industrial plants in Montana and other previously committed construction were also completed.

BPA power sales revenue from aluminum companies reached $20 million per year in 1956 and 1957, and then declined due to a softening in the market for aluminum. Some of the aluminum expansion went off the line after 1957 and caused a sharp reduction in the sales of secondary energy. This in turn resulted in BPA's first financial deficit for a single year, the annual deficit which went on for about six years until 1964, when BPA required its first-ever rate increase (a mere 3 percent) in order to be sure of staying in the black on a cumulative basis.

Luce Revives Industrial Sales. Soon after taking the oath as Administrator in February 1961, Charles Luce announced a reversal of the policy directive of former Under Secretary of the Interior Ralph Tudor. Luce adopted a positive planning policy aimed at increased power supply coupled with an aggressive power sales policy. Five major elements in the Luce program were the Hanford project, the Treaty with Canada, the West Coast Interties, the Third Powerplant at Grand Coulee, and the Coordination Agreement. This program was followed by a surge in industrial power contracts.

In his 1961 annual report, Luce announced his intent to "meet the load growth requirements of the region, including those for new industries whose location in the region is dependent upon the availability of low-cost power." In the 1964 annual report Luce reported a 4-year 25 percent rise in power sales to industry and commitments in the form of new contracts to increase firm sales by 40 percent. The new contracts totaled nearly 500,000 kW of firm and 125,000 kW of interruptible. The 1964 annual report devoted two pages to the "spectacular" increase in new industrial sales. The 1965 annual report called attention to a 4½ year rise of 700,000 kW in industrial power sales from 1,123,000 kW in March 1961 to 1,820,000 kW in October 1965 plus new contracts to sell 485,000 kW. Counting the new contracts, Luce boasted of a 100 percent increase in industrial sales and a likely 50 percent further increase of 600,000 kW depending on negotiations in progress, plus inquiries for another 575,000 kW. The 1964 and 1965 reports also called attention to new industries served by utilities which buy BPA power. In his 1966 annual report, Luce referred to "booming" industrial sales. From December 20, 1965, to October 17, 1966, BPA contracted for 836,000 kW of new firm power sales to industry, for a 3-year total of new industrial firm power sales of 1.3 million kW plus 152,000 kW of interruptible. Also pending were 280,000 kW in firm and 47,500 kW in interruptible contracts. Luce concluded:

"This is the greatest period of industrial sales in BPA history, and commits nearly all the power BPA can sell to industry until new resources are assured."

It should be pointed out that as of 1964 the projection of power supply made possible the added sale of power for industry. At that time projections indicated that power supply was adequate for preference customers through 1982, as well as some for investor-owned utilities to 1978.

Goldhammer Justifies Power for Industries. Probably the most comprehensive statement on the positive contribution of the industrial sales policy was made by Power Manager Bernard Goldhammer in his remarks to the Bonneville Regional Advisory Council, December 5, 1966. First, he itemized the benefits to BPA and the region historically from high load factor firm power sales and, after 1948, the accompanying secondary energy sales. The early loading of Bonneville and Coulee generators quickly put BPA on a sound business basis and also stimulated the earlier start of construction of a dozen hydroelectric projects. He pointed out that industrial power sales helped to keep BPA costs low and thus helped provide low-cost power for the preference customers and other utilities. Flood control and navigation goals were achieved earlier. BPA was able to undertake the large commitments of the Treaty with Canada. High load factor industrial loads helped to insure the stability and reliability of the transmission system and permitted the adoption of higher voltages and greater capacity. But mainly Goldhammer saw economic benefits for the region. He summarized:

"I feel that Bonneville's sale of power to industry has been good for the region, it has been good for our customers, it has meant lower wholesale power rates and lower retail rates than otherwise could have been achieved, it has helped diversify our economy, it has provided jobs, it has provided income for the area. And I think that the continuation of this policy will be good for the economy and for our customers."

The Goldhammer appeal notwithstanding, the Public Power Council, comprised of the public and cooperative electric systems of the region, expressed concerns about any more large blocks of power being sold to industry. The PPC foresaw only modest increases in firm power supply after completion of the Treaty projects in 1973.

Bottom of the Barrel. On November 29, 1967, BPA's Spokane Area Manager Norman A. Gilchrist addressed the preference customer meeting at Portland to express BPA's general concurrence with the Power Council's suggested guidelines for a more formal industrial sales policy. BPA adopted such a policy on January 22, 1971. In late 1973, BPA prepared 38 pages on its industrial sales policy and activities (position papers) for use during the budget hearing. On paper the 1971 policy may still exist, but in reality BPA stopped making contracts with new industries in 1966, except for small amounts of power made available for existing industries under Phase I of the Hydro-Thermal Power Program. The outlook is for power shortages into the 1990's. Thus it is uncertain when, if ever, BPA will again make large blocks of power available for new industries or that it will even be able to serve its existing customers beyond current contract terms.

Mention should be made of a decade-long study *Pacific Northwest Economic Base Study for Power Markets* launched in 1958 under the leadership of James Gruetter, Chief, Branch of Power Marketing. When completed in 1970, the summary volume presented the findings of 21 published reports on specific industries, mostly in electrochemicals and metals. The report is premised on the assumption that basic manufacturing industries determine economic growth. Regardless of any conclusions, the regional power supply has been sold out since 1966. Promotional efforts stopped. The Branch of Power Marketing was absorbed in the Branch of Power Resources as the Requirements Section.

Public Attitude Changes. The attitude toward heavy industry has changed. The blue collar job is still important but no longer all-important. A substantial public skepticism toward large industries has developed.

Another useful perspective on the impact of BPA's industrial sales policy is provided by the employment statistics of the Pacific Northwest for 1939 to 1975.

It may come as a surprise to many people that Pacific Northwest employment in manufacturing expressed as a percentage of total nonagricultural employment did not increase over this 36-year period but instead declined from 26 percent to 19.3 percent. This would hardly indicate that the region has become heavily industrialized.

The country as a whole had a similar response. From 1939 to 1975 U.S. nonagricultural employment went up about 2½ times from 30,618,000 to 77,050,000, of which manufacturing employment rose more slowly from 10,242,400 to 18,347,000, not enough to double. The net result was a national decline, relatively, in manufacturing employment from 33.4 percent to 23.8 percent.

BPA had no direct-service industrial customers in 1939, hence this is used as the base year. The latest published data is for 1975. The data appears by States, hence the four States (Washington, Oregon, Idaho and Montana) are treated as the Pacific Northwest.

As shown in the following table, the nonagricultural employment of the four States rose from 883,400 to 2,547,700, almost tripling, while employment in manufacturing more than doubled from 230,000 to 492,800, resulting in the relative decline from 26 to 19.3 percent.

Manufacturing Employment as a Percentage
of Nonagricultural Employment

(In thousands)

	1939		
	Non-Agr.	Mfg.	Ratio
Idaho	84.4	13.9	16.5%
Montana	109.4	12.2	11.1
Oregon	258.6	83.9	32.5
Washington	431.0	120.0	27.8
4 State Total	883.4	230.0	26.0%
U.S. Total	30,618	10,242.4	33.4%

	1975		
Idaho	267.5	46.5	17.4%
Montana	240.0	22.2	9.24
Oregon	830.8	182.3	21.9
Washington	1209.4	241.8	20.0
4 State Total	2547.7	492.8	19.3%
U.S. Total	77,050	18,347	23.8
	1943 (war conditions)		
Oregon	420.0	193.7	46.1%
Washington	735.5	289.1	39.3

(U.S. Dept. of Labor, BLS, Bulletin 1370-12)

The long-time advocates of industrialization can find some comfort in the relative shift in the percentage in manufacturing employment regionally as compared to nationally. The national level of 23.8 percent remains well above the region's 19.3 percent. The disparity between nation and region became less as evidenced by the greater national drop of 9.6 percentage points from 33.4 to 23.8 percent as compared to the lesser regional drop of 6.7 percentage points from 26 to 19.3 percent.

The 1943 statistics for Oregon and Washington are included in the table to show the all-time high and the peak percentage of manufacturing employment during World War II. Like most of the coastal States of the Nation, neither Oregon nor Washington has again reached the absolute number of war-time manufacturing workers.

Most inland states had less of a war boom in employment, and indeed these inland States lost population to the coastal areas, but the inland States have enjoyed a more steady growth in manufacturing employment which now exceeds their war-time levels. Nonetheless, it cannot be said that BPA's industrial sales policy has stimulated a rise in manufacturing employment to the point of reaching or exceeding the 1943 absolute levels in Oregon and Washington, nor to the point of reaching the national average percentage of manufacturing employment.

It can also be said that electricity has stimulated computerization, automation, and other forms of improved efficiency which results in more production from fewer workers.

Pacific Northwest aluminum plants directly employ more than 12,000 people; another 123,000 work in regional plants using aluminum. In a regional, non-agricultural work force of more than 2.5 million, the 12,000-plus aluminum workers constitute one half of one percent. The 123,000 other workers would add five percent based on the total employment. In terms of the regional employment of 492,800 in manufacturing, the direct aluminum employment of 12,000 amounts to about 1/40th or 2.5 percent of the 19.3 percentage total. If all employment is counted for plants using aluminum, this amounts to about one fourth or 25 percent of the 19.3 percentage. Thus the loss of both kinds of aluminum employment would significantly reduce the present level of manufacturing employment.

Meanwhile aluminum reduction technology is advancing. New plants use less electricity per pound of aluminum and have much less adverse environmental impact. More and more aluminum is being recycled and lightweight aluminum is being used increasingly in transportation, resulting in energy conservation. Research underway indicates that chemical methods of aluminum reduction could displace the electrolytic process, and require less electric power per pound of aluminum produced. Economic feasibility and other studies continue.

On balance, aluminum uses a lot of electric power for relatively few jobs. But some of the power is interruptible. This means that to the extent that the industrial firm power can be interrupted during emergencies, or periods of short supply, the aluminum plants provide valuable reserves to help assure continuous service to other loads — reserves that in other regions must be maintained, produce no revenue, and the cost of which must be paid by the consumers.

Society requires many kinds of employment. The ideal mix for any one area is not easy to define. Society as a whole changes its values and priorities, and within a society individual preferences prevail. Each vested interest seeks approval of its values.

This chapter has called attention to some historical perspectives on power for industry, and perhaps has provided an admonition for a flexible outlook. The farmer is no longer the bastion of the economy, nor is the blue collar worker or anyone else. All are important. Economic values are important as are social, environmental, and cultural values.

Columbia River development has strengthened and made more stable the Northwest economy and society. The region, however, still lacks a truly diversified economy despite the contribution of the Columbia River development and of the BPA program toward that end.

34. HYDRO-THERMAL POWER PROGRAM

If the flow of electricity should suddenly cease, it would be a national catastrophe of unimaginable magnitude. Our homes, streets, and highways would be in darkness. Street cars, subways, elevators, and conveyors would suddenly stop and even railroad transportation would be impossible at night without electric signals. Radios would cease to function and the ships on the high seas would be immediately endangered. Factories would be forced to shut down, modern bakeries would cease to produce bread, the water supply of cities would be interrupted by the failure of electric pumps and perishable food would rapidly deteriorate for lack of refrigeration. There would be no fire alarm, no burglar alarm, no telegraph, no telephone, and few newspapers. Electric light and power has come to be almost as essential an element in our daily lives as the bread we eat and the water we drink. Modern civilization would collapse with the failure of the sources of electric light and power.

National Power Survey
Federal Power Commission
–Interim Report, 1935

J. D. Ross used to say the Columbia River was an oil well that would never run dry, a coal seam that would never thin out. The Columbia was thought to have the greatest hydroelectric power producing potential of any comparable river system in the world. Political leaders and chamber of commerce speakers referred to its unlimited power. Rivers with greater power potential, of course, exist in Asia, Africa, and South America.

The Columbia River has limits. By the late 1940's, utility leaders who recognized its limits began examining the region's coal resources. As Northwest generators strained to meet Korean conflict loads in the fall of 1951, the House Committee on Public Works held hearings on H.R. 4963. Introduced July 26 that year by Representative Henry M. Jackson, it would have given BPA limited authority to build and operate fuel-fired generating plants as in southwestern Oregon, at the end of the BPA transmission system. Despite four days of hearings, the bill was not reported out, partly because it was enmeshed in a crossfire with Tacoma's proposed Cowlitz River dams. The conflict underlined the necessity for better planning and for reaching consensus within the Pacific Northwest.

The Senate Committee on Public Works adopted a resolution July 28, 1955, asking the Corps of Engineers to update its 1948 Columbia River 308 report to accommodate current requirements for flood control, navigation, power, and all related water uses. The resolution specifically requested "a restudy of hydroelectric power potentials as part of a combined hydro-thermal system." The Tennessee Valley Authority, Pacific Gas & Electric Company, Ontario Hydro, and other large utilities had demonstrated the transition from a hydro system to a hydro-thermal power operation.

Senator Richard Neuberger's 1958 regional power corporation bill proposed that BPA finance and build thermal plants.

Administrator Luce's 1966 annual report, his last one, suggested that thermal plants would be carrying much of the region's baseload by 1982. Administrator Black's transmittal letter in the same annual report said that the region had reached the "pivotal point" toward thermal generation. The Joint Power Planning Council, chaired by BPA and including the region's utilities, started plans to facilitate construction of large nuclear and coal-fired generating plants.

Through the Hydro-Thermal Accord, sponsored by Administrator Richmond and approved by Secretary of the Interior Stewart L. Udall on October 22, 1968, the Joint Power Planning Council (JPPC) had agreed on a $15 billion, 20-year program to construct new thermal, hydro, and transmission facilities. By January 1969, the estimated cost for the Hydro-Thermal Power Program had increased to $17.9 billion for the period through July 1990, of which $6.1 billion was to be Federal funds.

The Hydro-Thermal Power Program (HTPP), as formulated in 1968, was a planning document. It was a declaration of intentions. It showed on paper how the 20-year projected load growth could be served by building new generation facilities.

During 1969 the JPCC refined the more general 20-year list into a 10-year program of specific plants with specific sponsors. The list included seven large thermal plants, Jim Bridger coal in Wyoming, Trojan nuclear in Oregon, Centralia coal in Washington, three WPPSS nuclear plants in Washington, and PGE's Boardman coal-fired plant in Oregon. Preference agency loads served by six of these plants, leaving out Jim Bridger, would be handled by BPA by means of net-billing. This list became known as the 10-year HTPP, and later as the Phase I Hydro-Thermal Power Program.

President Nixon's approval of the ten-year Hydro-Thermal Power Program (Phase I), on October 27, 1969, and similar joint plans of other regions, led Secretary Hickel to revise the Interior Power Policy and reissue it September 30, 1970. It said:

"The Department encourages the construction and operation of electric power facilities by non-Federal interests that will develop and protect the natural resources in full accord with the broad public interest. All segments of the electric power industry are encouraged by the Department to cooperate in the planning, design, development and pooling of power generation and transmission facilities on a regional, interregional, and national basis which will provide an adequate and reliable supply of electricity.

* * * *

"The Department will sponsor and participate in research and development programs to insure continued technological advances in generation and transmission of electric power."

In the Public Works Appropriations Act of December 11, 1969, Congress approved BPA's proposed net-billing procedure for implementing the Hydro-Thermal Power Program with respect to the Trojan nuclear plant. The Public Works Appropriations Act of October 7, 1970, broadened the net-billing authority to apply to the seven thermal plants proposed under Phase I for construction during the 1971 to 1981 decade. Net-billing was to be applied only to the portions of thermal plants developed for accounts of preference customers. Under net-billing, BPA pays for project capability purchased by preference customers and assigned to BPA by offsetting against their monthly power bills their financial obligation in specific projects.

Largely formulated by BPA Power Manager Bernard Goldhammer, the net-billing device merged the higher thermal power cost into the BPA cost structure, which would be reflected in later BPA wholesale rate increases. More importantly, the BPA net-billing agreement in effect served as a guarantee for the bonds for a non-Federal plant. Consequently, the bonds generally received an AAA rating resulting in a good market and lower interest cost.

Secretary of the Interior Rogers Morton instructed BPA Administrator Hodel, on March 12, 1973, to begin planning Phase II of the Hydro-Thermal Power Program. Additionally, he was to do so by

"informally notifying all BPA customers that notices of power insufficiency, effective 1982, would be issued within one year unless the utilities and BPA developed a plan for carrying forward the program or some alternative procedure which would assure the region of a future power supply and minimize financial demands on the Federal Treasury."

On December 14, 1973, the utilities and BPA agreed to Phase II to extend through 1986, sans net-billing. It was recognized that the financial limits of net-billing would be exceeded by Phase II plants. In addition, the Joint Power Planning Council agreed to seek legislation to enable BPA to use power revenues to pay Federal Columbia River Power System operation and maintenance expenses, and to issue revenue bonds to finance construction of BPA transmission facilities including lines to handle power from non-Federal plants. This resulted in the Federal Columbia River Transmission System Act of October 18, 1974. The Comptroller General of the United States assessed the Hydro-Thermal Power Program favorably in report number B-114858 of June 5, 1974.

BPA's participation in Phase II of the Hydro-Thermal Power Program was challenged in connection with a court suit involving the power sales contract with the Alumax Pacific Corporation's proposed aluminum reduction plant at Hermiston, Oregon. The court ordered BPA to prepare an environmental impact statement (EIS) on the entire BPA program, on the socio-economic aspects of the Alumax plant location, and on the contracts relative to Phase II of the Hydro-Thermal Power Program.

The notice of power insufficiency of June 24, 1976, added to the compelling evidence of the need for new approaches for meeting future power load growth, specifically all preference agency load growth after June 30, 1983. Since January 1954, BPA power sales contracts with preference customers have included a general contract provision on

The Hanford New Production Reactor was not part of the Hydro-Thermal Power Program, but served as a precedent. The long generator house is to the right.

Centralia above and Boardman below are the region's two coal burning generating plants in operation.
Photos courtesy PP&L, and PGE

power insufficiency. It said BPA would give timely notice when it foresaw that firm power would run short. After the June 24, 1976, notice, BPA split the clause to provide five years' notice on firm energy and eight years' notice on firm capacity. The capacity notice has not yet been issued but may be given later in 1980. The outlook for insufficiency was a strong factor in the decision of BPA's preference customers to go ahead with construction of WPPSS Nos. 4 and 5, despite the fact that the plants would not be covered under net-billing. One of the issues in the pending regional power bill, S.885, was whether to cover WPPSS Nos. 4 and 5 under the bill, a position advocated by the preference customer participants.

The electric load forecasts are coming down. The 10-year compound annual growth rate of firm system loads of the West Group Area, as compiled by PNUCC, are shown for the last 22 years in the May 1980 *Power Outlook*. Particularly for the last seven years the forecasts of average firm energy loads have come down steadily from 5.59 percent for the 1974-75 to 1984-85 decade, to 3.50 percent for the 1980-81 to 1990-91 period. Despite these declines in electric load forecasts, the regional power outlook is for greater shortages because of the accumulation of delays in the construction of thermal plants.

Despite problems, delays, and cost overruns, Phase I of the Hydro-Thermal Power Program is well along. Jim Bridger, Trojan, Centralia, and Boardman are operating. The three WPPSS nuclear plants will be very much needed as they become available, hopefully January 1983, June 1985, and June 1986.

Phase II of the Hydro-Thermal Power Program, however, remains substantially in toils. WPPSS has started building nuclear plants Nos. 4 and 5, and Montana Power Company has begun building Colstrip Nos. 3 and 4. As mentioned earlier, the May 1980 issue of *Power Outlook* shows new slippages of 44 months each for Skagit Nos. 1 and 2, and 63 and 64 months for Pebble Springs Nos. 1 and 2. No other significant thermal or hydro plants are authorized or committed. As this history went to press in 1980, the region was facing shortages of 2 million kilowatts in 1980-81 under critical water conditions, increasing to 4 million kilowatts in 1990-91.

Potential shortages can be eased if the Columbia River System has much better than critical water year conditions, but even the best streamflows in recorded history, if repeated each and every year in the decade, would not be enough to spare the region from serious power shortages in the '80s.

35. RENEWABLE POWER

The maintenance of man on earth is accomplished through the use of the energies incoming from the sun and from the stored energies of past evolutionary transformation of the planetary surface.

–John McHale
The Future of the Future
1969

Energy exists in all matter throughout the universe. Practical sources on earth divide between depletable and renewable forms of energy.

Depletable energy includes fossil fuels — coal, peat, lignite, natural gas and oil — and nuclear fuels — uranium and thorium. Most fossil fuels have their greatest value as chemical feed stocks for making plastics, drugs, chemicals, and many other products, including lubricants. Many conservationists believe fossil fuels should be saved as chemicals for future generations. The tax laws of the United States, however, provide a depletion deduction to mining, oil, and natural gas companies to encourage quick production.

Renewable energy comes from the sun as direct heat to warm the earth, support plant life, evaporate water, produce winds, energize waves, ocean currents, and ocean temperature gradients. Several hundred million years ago the sun also produced the biomass which became present day fossil fuels. A definition of renewable resources appears in the Senate version of the pending regional power bill, known as S.885 in the 96th Congress:

"'Renewable resource' means a resource which utilizes a renewable source of energy, including, but not limited to, solar, wind, hydro, geothermal, and biomass, and which is used for electric power generation or which will reduce the electric power requirements of a customer by direct application."

Geothermal heat is believed to be nuclear in origin, and is included here for convenience although not really a renewable energy form.

Converting Matter into Energy. The sun is an enormous fusion energy source. It is a giant thermo-nuclear furnace transforming hydrogen nuclei into helium. It consists of about 90 percent hydrogen, 10 percent helium, and 1/10th of one percent of all other nuclei. The conversion of one percent of the hydrogen to helium can keep the sun shining for one billion years. In the process about 3 percent of the matter is destroyed by conversion into energy. This reduces the sun's weight over four million tons per second, but the present rate of heat production can continue about 35 billion years.

The sun contains no solids, only a gaseous mixture. The temperature at its center has been estimated at 15 to 20 million degrees centigrade. The visible sun with the diameter of 865,400 miles is a thin layer of some 300 miles called the photosphere, a luminous layer of gas at a temperature averaging 6,000°C. From this huge surface, the radiation of energy is 70,000 horsepower per square yard.

The earth receives only about one/two billionth of the energy output of the sun. The outer atmosphere of the earth receives some 240 trillion horsepower of energy from the sun or about 1.6 horsepower per square yard. The atmosphere absorbs 15 percent of this heat, 43 percent is radiated outward mainly by clouds, and 42 percent reaches the surface of the earth. This gives the earth its various forms of renewable energy.

In the Pacific Northwest, a major form of solar energy is water power resulting from the hydrologic cycle of evaporation and precipitation. Montana's Senator James E. Murray opened the March 22, 1956, hearings on Upper Columbia River Development with this comment:

"Water power is our only perpetually renewable resource, except sunlight itself."

Administrator Charles Luce after taking the oath of office February 14, 1961, made this statement:

"Hydroelectric power is the nearest thing we have to perpetual motion and it is an ingenious way of harnessing the power of the sun. The Columbia and Snake River basins have a power potential of 38,000,000 kilowatts, of which 9,800,000 or only 26 percent has been developed. We owe a duty to the future generations of Americans who will some day face scarcity of petroleum and coal, to achieve the fullest development of our water power resources."

History of the Renewable Energy Policy. This and the next two chapters present three closely related, emerging policies, first to encourage the use of renewable energy resources, second to protect and improve the environment, and third to achieve energy conservation. The policies were launched in the decade of the 1970s.

When President Nixon on January 1, 1970, signed the National Environmental Policy Act, he announced the beginning of the decade of the environment. A series of "clean up" laws followed. The next year, in 1971, the United States reached the peak of its domestic oil production. On

June 4, 1971, Nixon sent Congress his Clean Energy Message. But the real public concern was aroused in 1973 as a result of the Israel-Arab War of October 6-24, 1973, and the ensuing oil embargo that lasted until March 1974. Oil prices doubled.

President Nixon had meanwhile asked the Chairman of the Atomic Energy Commission, Dr. Dixy Lee Ray, to recommend a five-year energy research and development program. Her December 1973 report, "The Nation's Energy Future," while supporting nuclear power, placed major attention on renewables, conservation and environment. She recommended doubling the energy R&D budget and this was done in 1974. Some items, such as solar energy, have been redoubled again and again. In 1971, Congress had authorized the Atomic Energy Commission to pursue non-nuclear energy research and development but that area remained low key until the public was lining up at the gas stations the winter of 1973-74.

The energy R&D budget began to appear as a table in the Special Analyses volume of the President's Budget Message for fiscal year 1974. It showed that solar and geothermal research began in FY 1972 at $3 million, then rose to $8 and $16 million in 1973 and 1974. By January 1980, in the Budget Message for FY 1981, the solar applications budget is recommended at $165.6 million, solar technology for $372 million, and geothermal for $133 million. With tax credits and other Federal agency budgets, the renewable energy R&D activity is at a billion dollars a year.

In his Solar Energy Message to the Congress June 20, 1979, President Carter called for a national goal for the year 2000 of meeting 20 percent of U.S. energy consumption from renewable resources.

A Department of Energy policy guideline of January 30, 1980, lists nine categories of solar energy in descending order of anticipated importance: 1. biomass, 2. hydroelectric, 3. agriculture and industrial process heat, 4. active heating, cooling, and hot water, 5. wind, 6. photovoltaics, 7. passive design, 8. solar thermal power, and 9. ocean systems.

By January 1980, the Special Analyses volume of the Budget had evolved in seven years from virtually no mention of energy to a special 20-page study entitled, "Solving Our Nation's Energy Problem." Energy had become recognized as a major national problem.

In the Pacific Northwest, the pending regional power legislation requires that BPA facilitate renewable energy and conservation to the limit of cost effectiveness.

Northwest Hydro Half Developed. Any history of renewable energy in the Pacific Northwest invariably leads to the question of what happened to the region's longstanding devotion to that favorite form of solar energy — hydroelectric power? Barely half of the region's water power has been harnessed.

More than a third of the Nation's potential water power exists in the Pacific Northwest Drainage (PND), which is the Columbia River within the United States, and the coastal streams of Oregon and Washington. The latest FPC report of January 1, 1976, showed a potential of 61.2 million kilowatts of installed capacity of which 22.3 million was developed or 36.5 percent of the potential. In terms of average annual energy production, the potential is 240.7 billion kilowatthours of which 127.4 billion has been developed, or more than half.

When authorized and proposed peaking generators are installed at Grand Coulee, Bonneville, Libby, McNary, and other existing dams, the PND installed capacity should approximate 30 million kW or half of the physical potential. Thus it can be said that the region's water power is or soon will be half developed in terms of both installed capacity and energy production.

Wilderness, scenic rivers, national parks, and recreation areas were already in part reflected — that is, omitted — from the 1976 FPC report, and will result in a further reduction of about five million kilowatts, mainly in the Hells Canyon reach of the Snake River, when the 1976 report is updated and reissued.

In part offsetting or countering these reductions in the available potential is the drastic change in the economic value of water power. The former FPC (now Federal Energy Regulatory Commission, or FERC) has set a water power value of 32 mills per kilowatthour as of 1985. For realistic planning purposes, for the late 1990s, the value is in the 5 to 10 cent per kWh range. The leadtime for planning and building hydro is now on the order of 15 years, and the Corps of Engineers estimates it will soon be 20 years. Small hydro and redevelopment of older dams, however, could be accomplished in less time, although it appears as difficult to gain site-specific acceptance for small projects of this type as for large ones.

The Pacific Northwest River Basins Commission in 1979 published a list of 32 upstream storage sites available in the headwaters of the Columbia River with a usable storage of 26 million acre-feet. The Commission pointed out that the storage would be multiple purpose, providing irrigation, fishery, and power benefits as well as local flood

Scenic Palouse Falls is not in danger of being harnessed for electric power. Spectacular falls seldom represent much power. Pictured above is a sketch of the first two 2,500 kW wind-powered generators of the three scheduled at the Goodnow Hills in Klickitat County, Washington.

Ray Atkeson photo

control. The Corps of Engineers is reviewing the list of potential water power sites.

Present Policy on Renewables. National policy favors development of renewable energy resources by providing research and pilot plant funding and offering tax incentives.

BPA has undertaken assessments of every major form of renewable resource potential in the region. In the case of forest residue for cogeneration plants, BPA has sponsored or taken part in several feasibility studies. Pilot studies are in progress for geothermal, wind power, solar panel, and solar photovoltaic installations. Three giant Boeing-built windmills — the world's largest — are being installed at Klickitat County under DOE-BPA sponsorship. BPA in 1979 sponsored the first annual conference on renewable resources.

Administrator Sterling Munro has made renewable resources one of the main subjects of his speeches. Most recently in addressing the Pacific Northwest Waterways Association June 25, 1980, at Wenatchee, he reminded his audience that the pending regional power bill gives renewable resources priority second only to conservation in terms of the kind of resources the bill would authorize BPA to purchase. Using hydro as an illustration, he pointed out that water power is a renewable resource, and that upstream storage would provide multiple-purpose benefits. He pointed out that the regional power bill should serve to encourage hydro and other renewable resource development:

"The purchase provisions of the bill, authorizing BPA to acquire the capability of generating projects built by others — in effect underwriting their costs — also authorizes BPA to fund the upfront monies for studies, engineering, investigations, whatever work has to be done to qualify a project for licensing."

In other speeches, Munro has pointed out that the Federal Columbia River Power System could serve as a storage battery to level out and, therefore, make more usable the intermittent electric generation from renewable resource projects harnessing the wind and solar energy, for example, and that BPA could, under the bill if enacted, buy such energy to the limit of cost effectiveness.

36. PRODUCTIVE HARMONY

All things that accord with nature are to be counted as good.
–*Cicero*

Despite BPA's long concern for the environment, the ten years experience under the National Environmental Policy Act has sharpened BPA's awareness and concern for the environment, particularly with respect to transmission and substation facilities. BPA has recruited a staff to review major proposed actions in environmental terms. BPA customers will be required to pay somewhat higher power rates for environmental costs of all power facilities, including those at the hydro and thermal generating plants.

Productive harmony is the central policy of the National Environmental Policy Act of January 1, 1970 (NEPA). The Act opens:

"The purposes of this Act are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources of the Nation; and to establish a Council on Environmental Quality."

It declares that it is the national policy

"...to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."

Each Federal agency considering a proposed major action or proposing legislation significantly affecting the quality of the human environment is directed to prepare an environmental impact statement (EIS) to show:

— the environmental impact of the proposed action;
— unavoidable, adverse environmental effects;
— alternatives;
— the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and,
— irreversible and irretrievable commitments of resources.

Many expressions in the Act illustrate the twin objectives of achieving a good environment and good productivity, and "harmony" between them.

Over a century ago, George P. Marsh, in *Man and Na-*

ture: Physical Geography as Modified by Human Action (1864), deplored the "interference with the spontaneous arrangement of the organic and inorganic world." He suggested "restoration of disturbed *harmonies*" (emphasis provided). If NEPA borrowed from Marsh in seeking "productive harmony," it was with a major difference. In contrast to the preservationist conservation apparently suggested by Marsh, the NEPA goal of productive harmony seeks conservation in the sense of wise use and good design.

NEPA is a procedural law which requires Federal agencies to consider and file an adequate final environmental impact statement before deciding to take a major action significantly affecting the human environment. Other Federal laws deal with substantive requirements for clean air, clean water, pesticide control, and noise abatement. The NEPA procedures are important. NEPA requires national planning and documentation of the planning process. Public hearings and a comment period mean more communications, more information, an open process, and the right to appeal to a higher administrative officer or the courts. These requirements add to the leadtime for planning and building a project. On the other hand, the timely preparation of an EIS, and giving the public opportunities to comment, can involve the public at an early stage in the planning process and may speed up the process by reducing the exposure to law-suits.

The public concern for a better environment probably is as old as mankind. For centuries English common law has permitted citizens to complain of a public nuisance. The NEPA approach puts the emphasis not on belated correction but on prevention through better planning. The NEPA process seeks to improve the quality of Government programs and their overall value and effectiveness. Citizen involvement may add yet another dimension to the meaning of "harmony" by facilitating a more democratically arrived at decision.

Throughout BPA's history the public has expressed its environmental concerns on a number of issues. Preservation of the Columbia River Gorge was an early concern of the Pacific Northwest Regional Planning Commission. This led Administrator Ross to recommend, and the FPC to approve, the following provision June 8, 1938, as one of the General Terms and Conditions attached to all BPA power sales contracts:

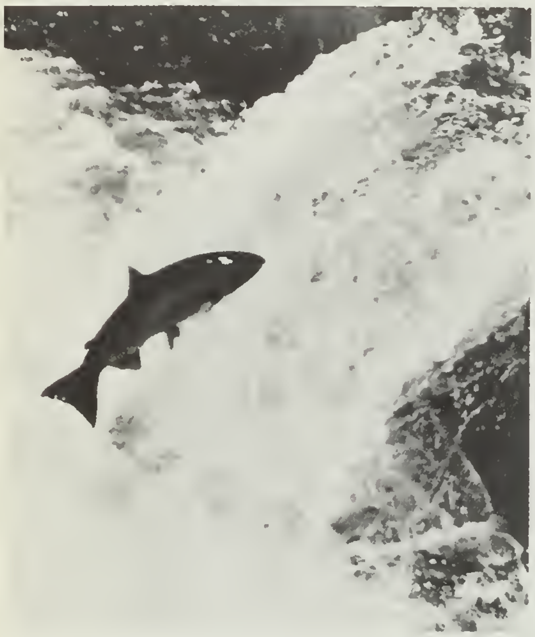
"Conservation of natural resources. Power from the Bonneville Project Power Plant shall be available only to those purchasers the waste products from whose plants or operations shall not be harmful to, or destructive of, the fish or other aquatic life of the Columbia River; nor otherwise pollute the stream; nor detract from the scenic beauties of the Columbia River Gorge."

This remarkable policy statement has been in all general contract provisions throughout BPA history and remains in effect. It emanates from a 1937 PNWRPC report on the Columbia River Gorge which urges a power distribution policy to discourage heavy industry in the Gorge.

Long before he became Administrator, Ross had directed landscaping of a mountainside area at Seattle's Skagit River Project with waterfalls, pathways, flowers, and plants. Colored lights and background music added to the attraction for thousands of visitors on the Skagit Tour. Ross collected exotic plants to further enhance the area. One of his first actions at BPA was to establish a nursery at the Ampere Substation near Vancouver, Washington, now the J. D. Ross Complex.

Another early major environmental and ecological concern prompted installation of fish ladders and a fish hatchery at Bonneville Dam. More than $200 million has been invested in fish ladders and fish facilities at Corps of Engineers projects on the Columbia and Snake Rivers. These costs were included in electric power rates.

The Columbia River estuary is the subject of current environmental studies. This unusual aerial view shows the north and south jetties at the mouth of the Columbia River.



In the early 1950s, BPA joined in sponsoring the Lower Columbia River Fisheries Development Program for tributaries below Bonneville Dam. The costs, and costs of research on anadromous fish, were included in power rates. Additionally, recreation and visitors centers have been provided at each dam as a project cost. Many of these early arrangements were handled through the Columbia Basin Inter-Agency Committee (1946-1966).

At the Intertie Victory Breakfast, in Portland, September 17, 1964, President Johnson spoke of beautifying America, an idea which he credited to his wife Lady Bird, and urged electric utilities to help. He formalized the goal to beautify America in his January 4, 1965, State of the Union Message, and a Special Message on Natural Beauty. In the latter, he called for a White House Conference on Natural Beauty, May 24-25, 1965.

Administrator Luce responded by hiring a firm of consulting architects — Stanton, Boles, Maguire, and Church — to review BPA facilities from an esthetic point of view. A year later the firm issued "A Report on Appearance Planning for BPA," written by Jack R. McFarland. BPA adopted the recommendations. The report was widely adopted by electric utilities as a reference.

BPA's 1966 annual report opened with color pictures of BPA substations showing a variety of pastel-colored transformers, switches, and other substation components. The reader is advised:

"At BPA this year our colors have begun to change. Freshly painted substations are in better rapport with the landscape — striking examples of our concern with appearance as a new criteria of design excellence. From trees to transmission towers, signs to substations, we hope an aesthetic awareness is showing."

The report devoted two pages to the appearance program, hailing it as "a new dimension in community responsibility." Thus to the old design criteria of function, cost, and safety, BPA added beauty.

Four years later the Secretaries of the Interior and Agriculture jointly issued a similar booklet for nationwide use, "Environmental Criteria for Electric Transmission Systems." It was largely based on the BPA report. The term "beautility," first suggested by Electrical World magazine, was used by BPA in its 1965 and 1966 annual reports.

In the past decade BPA has retired several hundred miles of older, low-voltage transmission lines to release rights-of-way for multi-circuit, high-voltage lines with as much as ten times the carrying capacity. The adoption of

The use of horses to pull the fish nets has been outlawed along with fish wheels. Early overfishing for salmon reduced the 1880 runs to one-third by 1933.

Ray Atkeson photo

500,000 volt a-c. and 800,000 volt d-c transmission with bundled conductors likewise optimized right-of-way use. The Pacific Northwest landscape thus features fewer but larger capacity transmission lines with less environmental intrusion.

This has only slightly increased the cost of power. The cost of transmitting a kWh had dropped from 1.01 in 1954 to 0.81 mills in 1965, but rose to 1.25 mills by 1974, according to the BPA 1974 Annual Report. These numbers, of course, prevailed before the recent inflation.

Administrator Hodel signed a memorandum of understanding November 29, 1976, as part of an effort to mitigate losses to the Columbia River anadromous fishery. BPA's cash contribution will be charged to power.

Because of low water levels in the Columbia during May 1977, large amounts of water were released from upstream reservoirs in "operation fish-flush" to assist fingerlings in their downstream journey to the sea. This operation is now requested annually, generally at a considerable loss of usable power and revenues.

Many other fisheries, wildlife, and environmental costs will appear in future power bills. Some $134 million will be added to lower Snake River dam costs to preserve wildlife or mitigate wildlife losses in those reservoirs and areas. Other programs include installation of screens, spillway modifications to reduce nitrogen supersaturation, and trucking fingerlings around dams.

BPA has prepared an environmental impact statement on its construction program annually since 1970. These have successfully passed muster under court review. From 1975 through 1979, BPA prepared a massive draft EIS on its entire program including its role in the Pacific Northwest electric power system. More than 100 employees and top staff members took part in the largest writing effort in BPA history.

The greatest service of the environmental challenge may prove to be the imperative for planning. NEPA originated from the public concern for a better environment. The response can be effective planning, coupled with better public understanding and involvement. NEPA is a congressional order that mandates good planning.

President Carter sent Congress a lengthy message on the environment May 23, 1977. Wide ranging, it focuses on conservation. Referring to the EIS process he warned

> "But to be most useful to decision-makers and the public, environmental impact statements must be concise, readable, and based upon competent professional analysis. They must reflect a concern with quality, not quantity. We do not want impact statements that are measured by the inch or weighed by the pound."

BPA has not solved all the problems or questions being raised in the name of environment or by environmental groups. These problems remain on the agenda. The agenda includes the whole gamut of questions raised by coal-fired and nuclear plants and the philosophical contention that the Nation should adopt a zero-population growth policy, and generally a no-growth policy. All electric load forecasts are challenged on the ground that energy conservation would preclude or reduce the need for any more electric generating plants and then, if more plants are needed, they should be from renewable energy sources; for example, solar energy should be used where feasible for house heating and water heating. The more than 5,000 public comments on the Draft EIS on BPA's Role should enable BPA to take many steps which may be constructive and which would otherwise not have been undertaken. Aside from substantive matters, the EIS process has helped BPA to strengthen its procedures for seeking public involvement in matters which certainly are on the minds of a lot of people.

37. CONSERVATION LEARNING CURVE

I do not know what I may appear to the world; but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me."

– Sir Issac Newton (1642-1727)

As he approached the close of a long life of learning, and contributing to knowledge, Sir Issac Newton (1642-1727) expressed this word of caution.

Historians refer to the time of Newton as the Age of Enlightment, an age of reason and the beginning of scientific endeavors. Knowledge has exploded since then, yet much of the ocean of truth remains undiscovered and underutilized. So it is with our knowledge of conservation, especially of energy conservation. We are basically at the beginnings of a long-range, long-term conservation learning curve.

Mankind has practiced subsistence type conservation through thousands of years of subsistence living. This continues in much of the undeveloped world. The more civilized world likewise owes much of its progress and culture to conservation achievements. The more congested industrial nations have in addition developed their own ways of making do with less. But for the most part, in the United States, we have a long way to go in achieving efficient energy use, which is to say we have a long way to go in conservation of energy.

Incessant warring has laid land to waste and consumed valuable resources. Forest land has been denuded and soil drained of its fertility to supply needs of a burgeoning population. Deserts are expanding. Exploitation is straining the limits of the natural resources of the world. Conservation has become a worldwide concern.

The movement of people westward in the United States led the Director of the Census in 1890 to announce the disappearance of the western frontier. George P. Marsh, Carl Schurz, Bernard E. Fernow, John Wesley Powell, William McGee, John Muir, Gifford Pinchot, and others called for action to safeguard natural resources. President Theodore Roosevelt dramatized and popularized the idea of conservation in 1908. A quarter century later, President Franklin Roosevelt revived the conservation idea, again emphasizing forests, soil, and water.

As Assistant Secretary of the Navy during World War I,

Pacific Power and Light Company's Terra One uses both active and passive solar energy as a heat source.

Franklin D. Roosevelt had watched the Navy's continued shift from coal-burning ships to oil, the development of fleet oil tankers, rapid fueling at sea, and the increase in the speed of ships. During his first two terms as President, he modernized and enlarged the U.S. Navy. In 1937 the National Resources Committee issued a report on energy, warning of shortages ahead. By 1939, the U.S. led the world in oil production. Natural gas, however, was profligately flared and wasted. Congress had just passed the Natural Gas Act of 1938. In February 1939, President Franklin D. Roosevelt's message to the Congress called for energy conservation:

"Our energy resources are not inexhaustible, yet we are permitting waste in their use and production. In some instances, to achieve apparent economies today, future generations will be forced to carry the burden of unnecessary high costs...National policies concerning these vital resources must recognize the availability of all of them; the location of each with respect to its markets; the costs of transporting them; the technological developments which will increase the efficiency of their production and use...and the relationships between the increased use of energy and the general economic development of the country."

"The widening interest and responsibility on the part of the Federal Government for the conservation and use of the Nation's energy resources raise many perplexing questions of policy determination. Clearly, there must be adequate and continuing planning and provision for studies which will reflect the best technical experience available, as well as full consideration for both regional and group interests."

President Truman's Materials Policy Commission warned of future mineral and fuel shortages in its five-volume 1952 report, "Resources for Freedom." The Suez Canal closure in 1956 sounded an early alarm of impending oil shortages. The U.S. National Academy of Sciences Committee on Resources and Man in its 1969 report included an article on Energy Resources by M. K. Hubbert in which he warned that oil and natural gas production would peak by the end of the 20th Century and then decline.

The Kennedy and Johnson Administrations helped conceive the broader notion of conserving the natural environment as an ecosystem. The new environmental ideas and the older conservation movement merged into a stronger force. But it still did not include energy adequately and realistically.

The 1970s brought the National Environmental Policy Act, the Mining and Minerals Policy Act, and some modest beginnings of energy conservation activity, the latter largely due to the 1973 oil embargo and price rises of the Organization of Petroleum Exporting Countries (OPEC). President Nixon issued a number of messages on energy and the need for both conservation and increased production. The House and Senate in 1973 extensively documented the need for energy conservation.

The Atomic Energy Commission Chairman, Dr. Dixy Lee Ray, in her December 1973 report to President Nixon, outlined a 5-year $11 billion energy research and development program. She assigned top priority to effecting ways to improve the efficiency of energy production and use. The significance of the report was that it recognized energy conservation is a learning curve.

Congress enacted conservation legislation in 1975 and 1976 aimed at improving automobile fuel use efficiency, converting to coal-fueled generation, increasing oil storage facilities, funding the development of State energy conservation plans, and studies for industrial energy conservation. These bills constitute only the beginning of a national energy conservation program. Carter's energy message of April 20, 1977, contained additional conservation proposals, and they are reflected in the National Energy Conservation Policy Act of October 15, 1978. This is one of the five new laws making up the National Energy Act.

Conservation in the Pacific Northwest. In the Pacific Northwest, the "conservation heritage" is entering its third stage. This stage will be different, important, and far-ranging because it will more directly involve all the people of the region. It may require more than a decade of what this chapter calls the conservation learning curve.

By way of perspective the first stage was the harnessing of the water power. Under the definition that conservation means the wise use of natural resources the region, mainly through the Federal Government, developed the Columbia River by means of multiple-purpose water resources projects. The first stage could have ended with the mere sale of the resulting surplus hydroelectric power.

The second stage of electric power conservation in the Pacific Northwest evolved largely through the leadership of the Bonneville Power Administration. BPA played a major role in planning, encouraging, and facilitating the hydraulic and electrical integration and coordination of the region's power supply by using many of the techniques of power pooling and power management. BPA's major programs, or programs in which it played a part, have resulted in large energy conservation benefits.

Administrator Munro identified five major "conservation programs" in addressing BPA's sixth annual Energy Conservation Management Conference March 29, 1979, and he again listed these at the 7th conference, March 10, 1980.

1. Leadership in transmission technology to build one of the world's largest transmission grid systems for the reliable and efficient movement of electric power. Use of high voltages and of capacitors minimizes line losses. Saving energy is a major objective.

2. Facilitating the building of the Hanford Generating Project to use the byproduct or waste steam from the dual purpose N-Reactor. Some 47 billion kilowatthours have been produced in the past 14 years, energy that would otherwise have gone to waste.

3. Negotiating the Columbia River Treaty with Canada. In addition to controlling floods on the mainstream and providing at-site power at Mica Dam, the Treaty provides 15.5 million acre-feet of usable upstream storage in Canada which produces about 2.8 million kilowatts in the United States at the downstream projects for sharing between the two countries. The Treaty also cleared Libby Dam for construction.

4. Negotiating the Coordination Agreement furthered the power pooling efforts started as early as 1942. This applies the integration or principle of single utility operation which increases the system's load-carrying capacity about 1,500,000 kilowatts as compared to isolated utility operations.

5. Planning and negotiation of the Pacific Northwest-Pacific Southwest Intertie which is credited with saving 230 million barrels of oil since the start of operations in 1968.

Other BPA programs also conserve energy. These five big programs, however, produce macro economies, yet are not usually thought of as energy conservation.

Against this background of stage one and stage two conservation efforts, BPA began in 1973 to talk up the idea of energy conservation on the other side of the meter, by the user of electricity.

BPA came by its energy conservation experience gradually. Energy shortages during and after World War II and the Korean conflict led to the creation of a priority system. Short-term power curtailments were experienced in 1948 and 1952.

BPA began preparing in the fall of 1972 for a power

Insulation continues to be the main stay and the top priority of the energy conservation programs of electric utilities.

shortage. It established a conservation office. The 1972-1973 drought taxed BPA resources. Precautionary measures were intensified months before the oil embargo. Rains in December 1973 increased the availability of hydroelectric power. By contrast, the gasoline shortage extended into March 1974. That month Administrator Hodel sponsored BPA's first energy conservation management conference. The annual conferences represent a continuation of the effort for a regionwide energy conservation program. Hodel stated a viewpoint, in a November 1975 speech, which he has often repeated:

"I am proud that Bonneville Power Administration has taken a lead role in the program mounted by the utilities and others to promote both internal and external energy conservation. Its detractors frequently attack BPA and point to its 1937 Congressional mandate to encourage 'the widest possible diversified use of electric power...' as being anti-conservation. I maintain that this phrase *demands* that we practice conservation and encourage it among our customers; otherwise mandatory curtailments or blackouts could occur and these would inevitably narrow the 'widest possible' number of customers who could be served."

More recently in his speech of August 22, 1977, entitled "Energy Conservation as a Resource," Hodel said:

"The keystone of our developing national energy policy must be the intelligent conservation of all energy resources in every sector of our society."

Throughout 1974, 1975, and 1976 BPA had enough power to meet its firm loads and to export surplus energy to California. It was difficult to plead for conservation except for the long-term. The conservation effort in 1975 and 1976 included the preparation of an environmental impact statement with substantial emphasis on energy conservation.

The 1977 regionwide drought brought renewed interest in energy conservation. While public response in times of shortage has been gratifying, electric utilities view the future with much concern. They ponder the most effective ways and means to assure conservation as a way of lessening the necessity for mandatory curtailment.

Meanwhile, as previously discussed, Pacific Northwest utilities provided for energy conservation in the various drafts of legislation for the regional power program.

An immense scope and variety of measures lie ahead to conserve energy, minerals, and other material resources. Conservation is as wide as the economy and the range of human endeavor. The emphasis on research is appropriate because so much is yet to be learned.

On the Other Side of the Meter. Electric utilities have respected the other side of the meter as the customer's domain of privacy. If the wiring conforms to code, the utility installs the meter and turns on the juice.

The times have changed. Energy conservation in the long run is in the best interest of all customers, utilities, and nations. It has become the national imperative. Federal and State laws are being enacted. Loan programs and tax incentives are being provided. Research is underway.

The national focus is on oil conservation, to reduce oil imports, and to reduce the imbalance of trade and payments. Although sharing in the national focus on oil, the Pacific Northwest has its own electric power supply shortage as well, which calls for electric energy conservation.

The Bonneville Power Administration has increased its energy conservation staff, and is embarking on its own energy conservation learning curve. Aside from the inhouse savings at substations and offices, in the motor vehicle fleet, and in system operations, the challenge facing BPA is in how best to work with the utilities of the region.

Administrator Munro is venturing into this arena by means of pilot programs, each with one or more cooperating utilities. The first four pilot programs included: (1) BPA-financed insulation based on house audits; (2) BPA financial assistance for solar water heater installations; (3) BPA financing of 12 family-sized wind-driven generators in Klickitat County; and (4) BPA financing of the testing of irrigation pumps to improve efficiency.

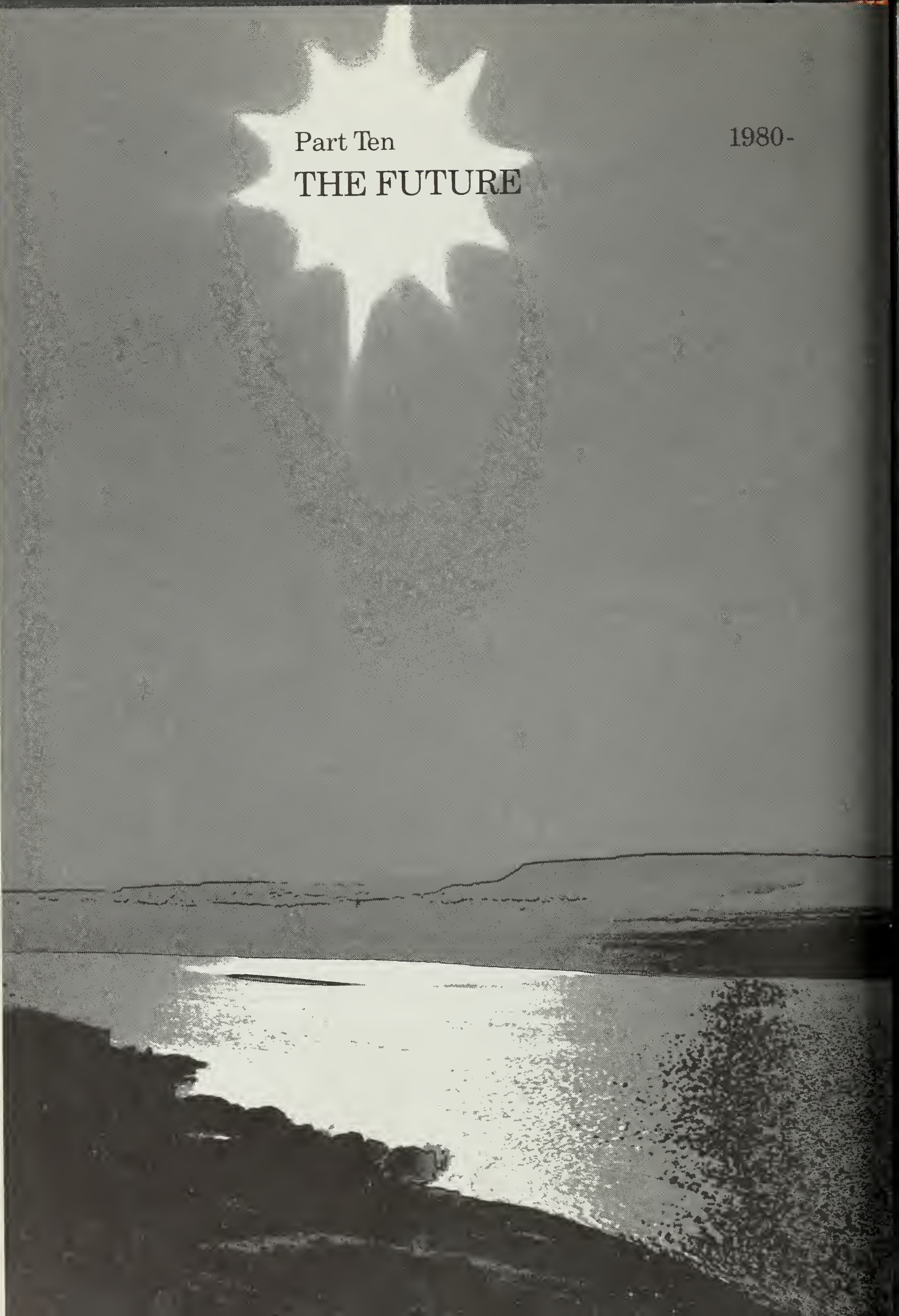
The next round of energy conservation pilot programs were to expand the original four and add others in order to prepare BPA for the day, expected soon, when it would have the necessary congressional authorization to expand the pilot programs into a full-scale regionwide conservation effort. The new pilot program BPA had on the drawing board in 1980 included a heat pump program and audits for commercial customers. Still other pilot programs were under consideration, including in the industrial sector. These pilot programs are designed to lay the groundwork of experience and verification of cost effectiveness as a basis for enabling BPA and the utilities to enter into loan programs for financing energy conservation when the regional power legislation is enacted.

Yes, the other side of the meter is becoming a new world for electric utilities. The people over there are still the same old customers, but the utilities have a new message, would you please use less electricity.

Part Ten

THE FUTURE

1980-



38. IN LEAGUE WITH THE FUTURE

I hold that man is in the right who is most clearly in league with the future.

– Henrik Ibsen

If we could know where we are and whither we are tending, we could better judge what to do and how to do it.

– Abraham Lincoln

I think that Lincoln said, 'Until you know where you have been, you don't know where you are going.'

– John F. Kennedy

The future is not entirely unknown. The people of the Pacific Northwest face their future with the distinct advantage of having one of the finest hydroelectric power systems and one of the largest and most sophisticated transmission grid systems in the world. The Columbia River development for power, navigation, irrigation, flood control, and other purposes represents a Federal Government investment of about 8 billion dollars, and is worth several times that much. All this, coupled with technically competent staff and many new programs in progress, can be a solid foundation on which to build the future.

This last chapter sums up the Bonneville experience and restates that experience in the form of perspectives which bear on the future.

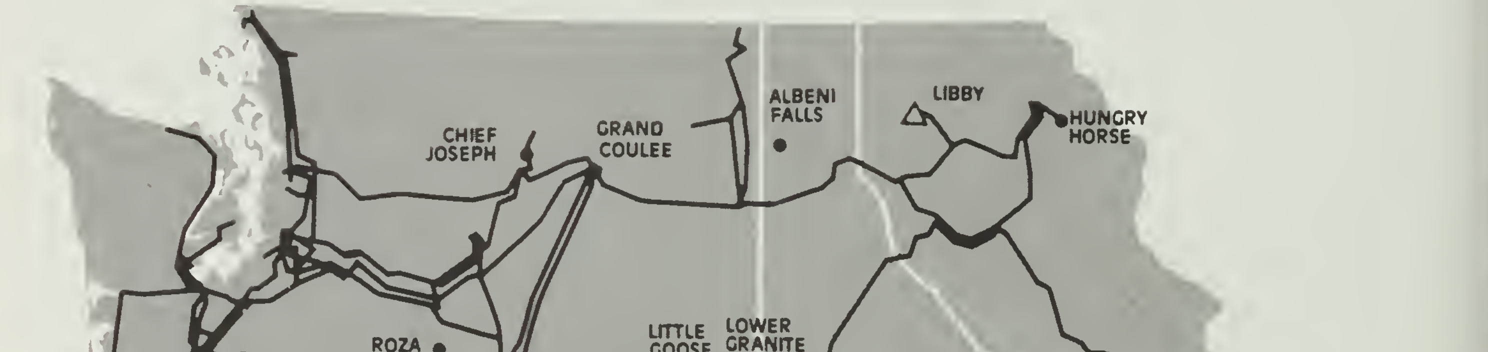
The broadest of these perspectives, and the most extensive geographically, is the world-wide energy crisis. The next largest horizon is the national perspective. In terms of the BPA program, the policy perspective will be divided four ways, (1) those policies which have substantially run their course to completion, (2) those which are active and continuing, (3) some which have faded and atrophied, and (4) the new ones which are emerging and moving into position to become full-fledged, ongoing policies and programs of the future.

Some historical perspectives, previously mentioned, will continue to be very much around. One such perspective concerns some long-term strands of history illustrated by the century-old conservation movement and the national movement for building public works and developing natural resources. A second historic strand and perspective encompasses the evolving and changing values of our society, as illustrated by the shift in emphasis in this century from engineering to economics and now increasingly to social objectives. Third is the political perspective involving the process of approval or disapproval of major BPA policies and programs. This area is expanding both be-

The sun burst over the Columbia River symbolizes the shift to the use of renewable energy resources, including hydro, which come mainly from the sun.

cause energy is receiving high level, national attention and because the Pacific Northwest is entering a period of exposure to severe power shortages. The political perspective will pretty much conclude the summing up because much of the future direction of the BPA program is likely to be determined by Congress.

The summing up necessarily begins with the world-wide crisis in crude oil supply. Crude oil has become the common denominator of the world energy problem. The United States is the biggest user and biggest importer. In 1979, imports rose to slightly over 8 million barrels per day and cost $70 billion for that year. Moreover, at the end of 1979, the world price of crude oil again rose sharply. Unrest in the Middle East foreshadows more price increases and probable reduction in supply. President Carter has pledged that U.S. crude oil imports will not be allowed to exceed the 1978 level of 8.2 million barrels per day. Others predict that imports may need to go up to 15 million barrels per day before other energy programs can be effective. Thus energy, worldwide, has become important. In the United States, the subject of energy dominates both foreign and domestic policies as the Nation enters the 1980s.



BPA's primary international relationship is with BC Hydro under the Columbia River Treaty. A much broader group of relationships, however, exists at the national level because BPA is an arm of the Federal Government and has contact with many other Federal bureaus and agencies. The chief national involvements of BPA are with the Department of Energy and with the Congress. Both involvements could bring new assignments and responsibilities, and, as discussed later, new legislation.

The first time that energy received major and prolonged national attention was from 1933 to 1937. President Franklin D. Roosevelt was preeminent on the subject of electric power. As Assistant Secretary of the Navy during World War I, he supervised the Navy's shift from coal to oil and also noted the electric power shortages during the war. For two decades he sought the public development of water power at Niagara and on the St. Lawrence. He saw the need for rural electrification and the opportunity of the Tennessee Valley and of the Columbia River. He felt strongly about improved regulation of utilities. The New Deal laws of 1933 to 1937 created TVA, SEC, REA, BPA, and a strengthened FPC. These five laws constituted a turning point in the national approach to the electrical opportunity, and changed the Federal Government role from passive to active. Equally important, Roosevelt obtained the public works funds and other appropriations to build the Bonneville and Grand Coulee Dams, dozens of dams in other parts of the country, transmission facilities, and, by means of REA loans, thousands of miles of rural electric lines.

President Roosevelt took a particularly strong interest in Columbia River development and creation of the Bonneville Power Administration. Any selection of key documents to seal in the 1937 time capsule would include his 1932 Portland campaign speech, his 1934 and 1937 speeches at Bonneville Dam, and a copy of the Bonneville Project Act of August 20, 1937. At the dedication of the Bonneville Dam on September 28, 1937, he expressed his hopes that,

"Truly, in the construction of this dam we have had our eyes on the future of the Nation. Its cost will be returned to the people of the United States many times over in the improvement of navigation and transportation, the cheapening of electric power, and the distribution of this power to hundreds of small communities within a great radius.

"As I look upon Bonneville Dam today, I cannot help the thought that instead of spending, as some nations do, half their national income in piling up armaments and more armaments for purposes of war, we in America are wiser in using our wealth on projects like this which will give us more wealth, better living and greater happiness for our children."

Opening President Roosevelt's 1937 time capsule 43 years later, one can see that some BPA policies and programs have been substantially achieved. The fear that the power would not be used vanished as the last Grand Coulee generator went on line in 1951 and the region was somewhat short of power in 1952. Rural electrification went past the 99 percent mark by 1960, thus substantially achieving the goal of widespread use. The eighth navigation lock brought barge traffic to Lewiston, Idaho, in 1976.

When he signed the August 26, 1940, Executive Order directing BPA to market Grand Coulee power, he emphasized the seriousness of the national defense emergency. Within 4 years, Pacific Northwest aluminum production grew from zero to more than a third of the national total. President Roosevelt probably found special satisfaction from BPA's contribution to winning the battle of war production.

In the 1960's, the Luce administration extended the BPA horizon substantially beyond the scope contemplated in 1937. The Pacific Intertie and the Treaty with Canada and over a dozen related programs launched a golden age of BPA history. Another important expansion is epitomized by the 1974 Federal Columbia River Transmission System Act. This confirmed BPA's authority to wheel power and thus its function as a power broker for the region, an idea that took 30 years to evolve.

In addition to the goal of navigation to Idaho, the achievements of a nonpower nature include mainly flood control and irrigation. Mainstem Columbia River floods have been cut in half, thus completing that goal. Willamette River floods likewise are substantially controlled. Libby Dam now controls Kootenai River floods. Virtually all other Columbia River tributaries remain exposed to their historic floods. Irrigation of arid and semi-arid lands has steadily moved forward in the form both of the traditional Federal reclamation program and by the use of sprinkler irrigation. In addition to the large sums mentioned in chapter 36, as already charged to power, for fish protection and enhancement, the pending regional power bill has strong provisions for fish.

Economically the Pacific Northwest has prospered along with or more than the Nation as a whole. Population has doubled. Year-round employment predominates as compared with the earlier pattern of seasonal employment. The standard of living and the quality of life have improved.

This recital of accomplishments is far from complete but is representative. It might suggest that some policies and objectives of the Bonneville Act have run their course. The most obvious one is the widespread use clause which played a role in extending rural electrification. It is true that BPA power now reaches the outer boundaries of the BPA service area, but the lot of the manager of a rural electric cooperative is still difficult. Every year the plan of service is reviewed, new transmission lines and substations are planned, or larger transformers installed. Even in this spectacularly successful program of service extension there remains the day-to-day continuing followup.

Sailing on the Columbia River is one of several forms of recreation which are rapidly expanding.

Ray Atkeson photo

The effort is less crucial and less intense than in the days of peak construction. But one bad windstorm is all it takes to black out thousands of rural homes. This is to say that maintenance of service is a continuing challenge.

Indeed, most of the policies of the Bonneville Project Act remain in an active, continuing status. In fact, many have been extended or expanded by such new authorities as net billing and wheeling. Transmission is now being built both for wheeling power for others and for disposing of Federal power. The postage stamp rate, the power-at-cost policy, the preference and anti-monopoly clause, and many other main policies of the Act remain intact or have been strengthened by subsequent enactments.

One must look hard to find a policy of the 1937 Act which has faded or atrophied. The only one which comes to mind was not so much a major policy as an expectation. It was expected in 1938 that BPA should enforce lowering of retail electric rates. J. D. Ross in October 1938 announced the objective rate and in time many utilities achieved that goal, and some utilities had even lower rates. Actually TVA was much more vigorous in this field because the TVA Act had a mandatory directive and contained teeth for enforcement. In time BPA found that its own policy of "cooperative consultation" served to operate perhaps more effectively than any form of coercion.

The most interesting of the four BPA policy perspectives concerns the new and emerging policies. These are not easy. Each will probably require getting on an extended learning curve. Four that are representative concern environment, energy conservation, renewable energy resources, and public involvement. A fifth one would be allocation of energy. All have been adopted in principle and some are past the incipient stage to the stage of pilot runs, monitoring the literature, and developing staff.

One potential policy area that has not reached any formal status may evolve from the renewed interest in retail rates, especially rates that might encourage energy conservation. BPA monitors the literature and notes the directives laid down by the Congress. Retail rates is an area that might be characterized as an incipient policy area.

In turning to some of the external forces or trends that make up BPA's climate, or that may directly involve BPA, the perspective of the conservation movement bears watching. The current wave is energy conservation and this may be a dominant policy for many years. But the conservation of minerals is an inevitable early next phase. The Minerals and Mining Policy Act of 1970 has set the stage and the Secretary of the Interior reports to Congress each year on the growing scarcity of minerals and our overwhelming dependence on mineral imports.

Another old, historical perspective is that of public works and development of natural resources. The need exists to expand or revamp much of the infrastructure of the Nation's urban areas, railroads, highway bridges, develop rapid transit, and build many kinds of energy producing, storing, converting, and transporting facilities. BPA may find itself involved in at least a small part of the wide range of public and private investments required for a virtual rebuilding of America.

Another strand of history consists of the changing sense of values. The indicated shift from engineering to economics to social objectives is not one of displacement. The process is additive. President Nixon's 1970 report of the National Goals Research Staff identified many areas in which attitudes were changing, including environment, consumerism, education, technology assessment, basic science, economic choices, and balanced growth. The whole area of social objectives will certainly provide an opportunity for utilities either to lead or be dragged.

Finally in this checklist of perspectives is the political perspective. BPA's relationship with the Congress presently revolves around the regional power legislation which passed the Senate in 1979 and which in 1980 was before the House of Representatives.

Epilogue

The Pacific Northwest Electric Power Planning and Conservation Act was passed by the House of Representatives on November 17, 1980, concurred in by the Senate November 19, and signed by President Jimmy Carter December 5, 1980.

When it appeared passage was imminent, BPA staff began compiling an *Implementation Planning Workbook* that set forth 32 implementing tasks and measured 1½ inches thick. Clearly, there was much to be done.

Meanwhile on Election Day, November 4, 1980, Ronald Reagan became the President-Elect. The plurality of 43.2 million to 34.9 million votes resulted in an electoral count of 489 for Reagan and 49 for Carter. Republicans gained control of the Senate 53 to 47. Democrats retained a House majority of 243 to 192.

Thus the untiring hand of history writes on. Regardless of political affiliation and views, most Northwesterners see in the region's new challenges the glint and sparkle of new opportunities.

Picture next page. At long last the Columbia River surges past Cape Disappointment Lighthouse and into the Pacific Ocean. The Cape is on the north side, or Washington shore.
Ray Atkeson photo

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A good start on researching the Bonneville Power Administration can be made by screening the annual reports.

The research methodology here used consisted of a grid approach with first a horizontal or overview search followed by specific, vertical study in depth on the particular policy, program or activity.

The horizontal method helps in identifying major policies, development of the table of contents, formulating a chronology, and, very importantly, looking at the external relationships.

The vertical approach may disclose that the documentation and explanation is already available or expert members of the BPA staff can put their hands on useful files. Moreover, these specialists can double check the draft of the chapter for accuracy. The vertical approach is characteristically detailed and specific.

Sources for an overview on BPA include the annual reports, the annual budget justifications and the resulting appropriations, minutes of the Bonneville Advisory Board 1938-1964, minutes of the Bonneville Regional Advisory Council 1944-1978, and minutes of the Executive Committee and later the Administrator's staff meeting, the Advance Program and later the Power Outlook. Speeches of the Administrator and the Administrator's monthly reading file can help in tracking the development of a policy or program.

Useful internal sources are the position papers prepared each year for the Administrator to use at the budget hearings of the Department and of the Office of Management and Budget.

Many of the references listed here are either external to BPA and Columbia River development, or they deal with policies which originated before BPA came into being. These references provide much light on the context or stream of events within which BPA exists and functions.

The BPA library has most of the sources or can obtain them on loan. Least used for this history was the Federal Record Center at Seattle. Future historians should explore the possibilities there more extensively.

For a more extensive documentation on BPA see the recently published BPA bibliography. The bibliographic notes therein contain more detailed suggestions for researching BPA.

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For legislative acts relating to preference to public and cooperative bodies in marketing Federal power and to the sale of power, power privileges or power facilities, see list in chapter on preference.

1902, June 17 Reclamation Act

1906, June 21 General Dam Act

1909, Jan. 11 Boundary Waters Treaty

1910, June 23 General Dam Act

1916, June 3 National Defense Act (Authorized Wilson Dam)

1920, June 10 Federal Water Power Act

1925, Mar. 3 River and Harbor Act (Authorized Corps of Engineers to submit cost estimates for surveys of navigable streams; estimates reported in 1926 in House Document 308)

1927, Jan. 27 River and Harbor Act (Authorized Survey which resulted in 308 reports on Columbia and other rivers)

1928, Dec. 21 Boulder Canyon Project Act

1933, May 18 Tennessee Valley Authority Act

1933, June 16 National Industrial Recovery Act (Established Public Works Administration. Facilitated construction of Bonneville and Grand Coulee dams.)

1934, June 6 Securities Exchange Act

1935, Apr. 8 Emergency Relief Appropriation Act

1935, Aug. 26 Public Utility Act

1935, Aug. 30 River and Harbor Act

1936, May 15 Flood Control Act (Congress declares flood control a national purpose)

1936, May 20 Rural Electrification Act

1937, Aug. 20 Bonneville Project Act

1940, June 13 Military Appropriation Act

1940, July 19 Boulder Canyon Project Adjustment Act

1941, Mar. 11 Lend Lease Act

1944, June 5 Hungry Horse Project Act

1944, Sep. 22 Pace Act (REA)

1944, Dec. 22 Flood Control Act

1945, Mar. 2 River and Harbor Act (Authorized McNary and four lower Snake projects)

1945, Oct. 23 Bonneville Act Amendment

1945, Dec. 6 Government Corporation Control Act

1946, Feb. 20 Employment Act

1946, June 11 Administrative Procedure Act

1946, Aug. 1 Atomic Energy Act

1949, Oct. 12 Interior Department Appropriation Act (Funds Kerr-Anaconda line)

1949, June 20 Reorganization Act of 1949

1950, May 17 River and Harbor and Flood Control Act

1950, Sept. 8 Defense Production Act

1957, Aug. 26 Public Works Appropriation Act (Wheeling authorized)

1958, Aug. 4 AEC Appropriation (New Production Reactor)

1959, Aug. 6 TVA Act Amendments

1961, Jan. 17 Columbia River Treaty (effective Sept. 16, 1964, at signing of Protocol Exchange)

1962, Sep. 26 AEC Appropriation Act (Hanford)

1964, Aug. 30 Public Works Appropriation Act (Intertie)

1964, Aug. 31 Pacific Northwest Regional Preference

1965, July 22 Water Resources Planning Act

1966, June 14 Authorization for third powerplant at Grand Coulee Dam (as amended Sep. 7, 1966)

1968, Oct. 2 Wild and Scenic Rivers Act

1969, Dec. 11 Public Works Appropriation Act (for fiscal year 1970 – Trojan net-billing)

1970, Jan. 1 National Environmental Policy Act

1970, Oct. 7 Public Works Appropriation Act (for fiscal year 1971 – Phase One, HTPP net-billing)

1970, Dec. 24 Geothermal Steam Act

1974, May 10 Wild and Scenic Rivers Act Amendment

1974, June 25 Federal Energy Act

1974, Oct. 11 Energy Reorganization Act (ERDA and NRC)

1974, Oct. 18 Federal Columbia River Transmission System Act

1975, Dec. 22 Energy Policy and Conservation Act

1975, Dec. 31 Hells Canyon National Recreation Act

1976, Aug. 16 Energy Conservation and Production Act

1976, Oct. 22 Water Resources Development Act (Replaces river and harbor and flood control acts)

1977, Aug. 4 Department of Energy Act

1978, Nov. 10 National Energy Act (in five separate acts)

CHRONOLOGY

Many strands of history precede Columbia River development. Discovery of the Columbia River in 1792 came 300 years after Columbus reached America, and his effort arose from the fall of Constantinople in 1453. The age of exploration and discovery is part of the background.

Four other strands relate more specifically as precursors. These involve the evolution and change in national policy 1) to build public works, 2) to conserve natural resources, 3) to promote navigation by means of projects such as Bonneville Dam, and 4) to irrigate dry lands as by the Columbia Basin Project with its chief feature Grand Coulee Dam.

In turn each BPA policy and program makes up a strand of evolving history, examples being the Columbia River Treaty, the Interties, Hanford, industrial sales policy, rural electrification, wheeling, and the preference clause.

1453	Turks seize Constantinople, cutting off caravan route to India, and launching search for water route and Northwest Passage.
1670	Hudson's Bay Company chartered, foreshadowing opening of Pacific Northwest for fur trade.
1792	Robert Gray discovers Columbia River.
1803	United States purchases Louisiana Territory.
1804-6	Lewis and Clark expedition.
1825	Hudson's Bay Company establishes Fort Vancouver.
1840	Democratic Party platform says Federal government should not make internal improvements. (This was first party platform in U.S.)
1846	Oregon Treaty sets 49th parallel as U.S. Canada boundary.
1849	U.S. Department of the Interior established.
1869	John Wesley Powell's boat trip down the Colorado River. Powell pioneers the conservation movement.
1874	Cascade Canal and Locks authorized to improve navigation.
1877	Munn *v.* Illinois lays foundation for utility regulation.
1877	Desert Land Act grants preference to water from public lands for irrigation.
1878	John Wesley Powell's *Report on the Lands of the Arid Region of the United States* published.
1879	Thomas A. Edison patents carbon filament electric light.

1879	U.S. Geological Survey established.
1882	Edison's Pearl Street powerplant in New York City begins operations.
1883	Pendleton Act (Civil Service) passed.
1886	Charles Martin Hall patents method for electrolytic reduction of aluminum from bauxite; forms Pittsburg Reduction Company 1888; name changed to Aluminum Company of America 1907.
1887	Congress creates Interstate Commerce Commission.
1888	Congress authorizes USGS to make irrigation survey of western lands.
1888	Willamette Falls Electric Company, predecessor of Portland General Electric, formed; sends direct current power from Oregon City to Portland June 3, 1889, changed to a.c. 1890.
1889	Washington Water Power Company is formed. McMinnville, Oregon establishes first municipal electric system in Northwest.
1892	General Electric Company is formed.
1896	Cascade Canal and Locks completed.
1902	Reclamation Act provides for irrigating arid lands; establishes Reclamation Service in USGS; becomes Bureau of Reclamation 1907.
1903	Theodore Roosevelt's Muscle Shoals veto prevents private electric development at Muscle Shoals on Tennessee River.
1904	U.S. Reclamation Service reconnoiters from Pend Oreille River to Columbia Basin; proposes "gravity plan" for irrigation.
1906	Act of April 16 applies preference principle to sale of electric power incidental to Federal irrigation program.
1906	General Dam Act passed; this and general Dam Act of 1910 assert Federal jurisdiction over water power on navigable rivers.
1907	Inland Waterways Commission created. Its report calls for multiple purpose development of river basins.
1908	First White House Governor's Conference on Conservation (May 13-15).
1908	Roosevelt's Rainy River veto and James River veto of 1909 lead to Federal Water Power Act of 1920.
1909	Canada and United States sign Boundary Waters Treaty; International Joint Commission created.
1911	Samuel Insull forms electric transmission grid in northern Illinois.
1913	Raker Act grants preference to public bodies in marketing power.
1915	Secretary of Agriculture reports 18 companies own more than half nation's developed water power.
1916	National Defense Act authorizes power dam at Muscle Shoals on Tennessee River for production of nitrates for munitions; Wilson Dam completed 1925.
1918	Publisher Rufus Woods of *Wenatchee Daily World* hails proposal for Grand Coulee Dam.
1919	220,000 volt intertie from Vancouver, British Columbia, to Los Angeles proposed by Professor Carl Edward Magnusson.
1920	Federal Water Power Act establishes Federal Power Commission.
1922	Senator George Norris introduces bill for Federal development of Tennessee River.
1923	Seattle and Tacoma build transmission intertie; Washington Water Power Company and Montana Power Company interconnect.
1925	*Giant Power Survey Board Report* warns of monopoly in electric utilities industry and urges statewide power grid for Pennsylvania.
1925	River and Harbor Act authorizes making an estimate of the cost of surveys of navigable streams.
1925	Senate requests FTC investigation of monopoly in electric utility industry.
1926	Corps of Engineers 308 report recommends surveys of navigable streams.
1927	FTC issues whitewash report on monopoly in electric utility industry.

1927	Senator Thomas J. Walsh charges electric utilities violate Sherman Anti Trust Act; demands Senate investigation.
1927	River and Harbor Act authorizes surveys resulting in 308 reports on the Columbia and other rivers.
1928	Senate orders FTC to investigate public utility holding companies.
1928	Boulder Canyon Project authorized.
1928	President Coolidge vetoes public operation of Muscle Shoals facilities.
1929	Stock market crash.
1930	Washington and Oregon voters approve PUD laws.
1931	President Hoover vetoes public operation of Muscle Shoals facilities.
1932	House Document 103 proposes Grand Coulee and Bonneville Dams.
1933	March 4, Franklin D. Roosevelt becomes President.
1933	Tennessee Valley Authority created.
1933	National Industrial Recovery Act passed; law is used to start construction of Bonneville and Grand Coulee Dams.
1934	Securities Exchange Act.
1935	Senator Pope's Columbia Valley Authority (CVA) bill, one of many bills (1935-37) for disposal of Bonneville power, introduced.
1935	Emergency Relief Appropriation Act passed; includes rural electrification.
1935	Rural Electrification Administration created by Executive Order; gains statutory basis in 1936.
1935	National Resources Committee (NRC) requests Pacific Northwest Regional Planning Commission (PNWRPC) report on future of Columbia Basin; PNWRPC holds public hearings and submits report.
1935	Public Utility Holding Company Act passed. FPC strengthened.
1935	River and Harbor Act passed; legitimizes Bonneville and Grand Coulee Dams.
1935	Charles E. Carey draws map of proposed transmission grid system for Pacific Northwest.
1936	Ashwander *v.* TVA affirms constitutionality of TVA.
1936	PNWRPC report endorsed and published by NRC under title *Regional Planning Part 1 – Pacific Northwest.*
1936	Flood Control Act passed. Congress makes flood control a national goal.
1937	Senator George Norris introduces Conservation Authorities Act of 1937. President Roosevelt sends Special Message June 3 urging establishment of regional planning agencies.
1937	Federal Power Commission's uniform system of accounts goes into effect.
1937	Report of the President's Committee on National Power Policy includes draft of proposed Bonneville Project bill. President sends February 24 Message to Congress recommending enactment.
1937	FPC report (Bonneville Rate Report) proposes uniform rate.
1937	August 20, Bonneville Project Act becomes law.
1937	J. D. Ross appointed Administrator of Bonneville Project.
1937	Ben Torpen urges Columbia River upstream storage development.
1938	German scientists split the uranium atom.
1938	Ross holds public rate hearings in Pacific Northwest.
1938	Bonneville Project sales contracts add provision for conservation of natural resources and preservation of Gorge.
1938	FPC approves BPA's $17.50 per kW year rate.
1938	President Roosevelt asks Ross to investigate feasibility of linking national power resources for national defense.
1938	Bonneville Dam completed, first generator on line.
1938	Bonneville Project obtains $10.75 million public works funds for transmission lines.
1938	Fort Peck Act passed.

1939	J. D. Ross dies March 14; Charles E. Carey, Acting Administrator, Feb. 1-May 4; Frank Banks, Acting Administrator, May 4-Sept. 14; Paul J. Raver becomes Administrator of Bonneville Project Sept. 15, serves until Jan. 14, 1954.
1939	Dec. 20, Bonneville Project contracts to supply power to Aluminum Company of America.
1939	Vancouver-Bonneville 230 kV line energized.
1940	Bonneville Project renamed Bonneville Power Administration.
1940	BPA opens field office in Yakima.
1940	Military Appropriation Act passed with funds for transmission lines.
1940	First Bonneville-Grand Coulee 230 kV line begins service at 115 kV.
1940	BPA directed to market Grand Coulee power.
1940	Administrator Raver establishes 5 district offices to effect decentralization and to promote rural electrification.
1940	BPA issues first 6 Year Advance Program; twice revised upward in May and in June 1941.
1941	Craft unions form Columbia Power Trades Council.
1941	FPC exposes political activities of private electric companies.
1941	Lend Lease Act passed.
1942	Manhattan Corps of Engineers District established.
1942	Hearings on Columbia Power Administration bill; no action.
1942	Northwest Power Pool begins operating.
1942	Nuclear fission achieved in Chicago.
1943	Manhattan Engineer District builds Hanford Works.
1943	BPA Executive Committee established; Roy Bessey appointed Executive Secretary.
1943	Bonneville Project completed, tenth generator energized.
1944	REA drafts 5-year post war electrification program.
1944	Hungry Horse Project Act passed.
1944	Pace Act extends REA Act, reducing interest rate.
1944	First Hanford reactor begins operating.
1944	Flood Control Act extends Federal Power Policy nationwide.
1944	Raver establishes Bonneville Regional Advisory Council.
1945	River and Harbor Act authorizes McNary and 4 Lower Snake dams.
1945	April 12 Franklin D. Roosevelt died.
1945	Ben Torpen report urges Columbia River upstream storage.
1945	Hanford delivers first plutonium.
1945	Bonneville Act Amendment liberalizes labor relations.
1946	Jan. 3, Secretary Ickes issues Federal Power Policy.
1946	Columbia Basin Inter Agency Committee established. Bonneville Advisory Board (1937-1946) becomes inactive.
1946	Tacoma Conference formed (renamed Pacific Northwest Utilities Conference Committee).
1946	Atomic Energy Commission created; replaces Manhattan Engineer District.
1946	BPA decides to sell power for reopening aluminum plants.
1947	Congress slashes appropriations for Federal Columbia River Power System; severely reduces BPA staff; abolishes power utilization staff.
1947	BPA reorganized under revised Administrative Order No. 59 (Nov. 3, 1943).
1947	FPC map of possible electric interties, including California intertie, published.
1948	BPA's 6-Year Advance Program includes transmission loop in southern Oregon and line into California.
1948	Columbia River Memorial Day flood leads to revision of 308 report to seek more upstream storage, authorization of new dams, and increased appropriations from Congress.
1948	BPA requires industries served directly to take one kWh of interruptible power with every 3 kWh of firm power.

1949	Kerr-Anaconda line funded, allowing Hungry Horse integration into BPA grid; results in extending BPA services into western Montana.
1950	Raver's "Objectives" published.
1950	Reorganization plan transfers all authority within USDI to Secretary; BPA Manual replaces Administrative Orders.
1950	River and Harbor and Flood Control Act authorizes projects at Albeni Falls, Libby, Priest Rapids, John Day, The Dalles, and reconfirms authorization of Chief Joseph Dam.
1950	Defense Electric Power Administration stimulates private dam building by means of fast tax write-offs.
1951	BPA and Reclamation Bureau directed to begin Central Valley Project-BPA intertie construction. Promptly cancelled by direction of House Appropriations Committee.
1951	Hearings held on Jackson bill, HR 4963, to authorize BPA to build and operate thermal plants; no action taken.
1951	"Labor-Management Relations in the Bonneville Power Administration" published by Senate Labor Committee.
1951	Grand Coulee's 18th generator begins operating, completing both powerhouses.
1951	BPA lays cable to serve San Juan Islands.
1952	BPA upgrades four district offices to area office status; strengthens decentralized administration.
1952	Ben Torpen urges CBIAC to seek more Columbia River upstream storage.
1952	$125,000 appropriated for feasibility investigation of third Grand Coulee powerhouse.
1952	House Appropriations Committee directs CVP-BPA intertie not be built until exhaustive study made.
1953	Eisenhower's partnership policy announced in State of the Union message.
1953	Secretary Douglas McKay issues revised Federal Power Policy.
1953	BPA contracts to wheel 8,000 kW from Box Canyon to Whatcom County PUD.
1953	BPA 20-year firm power sales contracts with 6 private power companies approved; not renewed in 1973.
1953	BPA program declines; cuts in budget and staff.
1953	Hungry Horse Dam completed; McNary and Detroit go on line.
1954	Administrator Raver resigns; succeeded by William A. Pearl (Jan. 15, 1954-Feb. 14, 1961).
1954	Atomic Energy Act amendment permits private ownership of nuclear materials and private manufacture of reactors.
1954	Partnership construction of five Pacific Northwest dams proposed in Congress; no action.
1954	Priest Rapids Dam deauthorized.
1954	Richard Neuberger's election gives Democrats edge in Senate.
1954	CBIAC establishes Power Planning Subcommittee to report on future load requirements, Federal hydro projects, and coordinated operation of power systems.
1955	Dixon-Yates contract cancelled.
1955	Attorney General Brownell confirms validity of preference clause in Flood Control Act.
1955	FPC licenses Idaho Power Company to build three dams on Snake River, precluding high Hells Canyon Dam.
1955	BPA energizes McNary-Vancouver 345,000 volt line.
1956	Hearings on Upper Columbia River Development (continued in 1958).
1956	November elections defeat power partnership policy; no dam partnership bills passed.
1957	Washington Public Power Supply System (WPPSS) formed by 16 public utility districts.
1957	Niagara Redevelopment Act expands preference clause.
1957	Public Works Appropriation Act of 1958 passed; supports Regional Solicitor's 1956 opinion that Bonneville Project Act is adequate au-

	thority for building transmission lines for wheeling.
1958	New Production Reactor at Hanford authorized; conversion feature to use waste heat in generating electricity included.
1958	Regional corporation bill introduced at request of Northwest Public Power Association; hearings 1958, 1959; no action.
1958	Corps of Engineers issues revised 308 report on Columbia River.
1958	BPA reports financial deficit.
1959	TVA amendments authorize TVA to issue revenue bonds.
1960	CBIAC's Power Planning Subcommittee begins issuing its "red book."
1961	United States and Canada sign Columbia River Treaty (implemented 1964).
1961	Charles F. Luce appointed BPA Administrator (Feb. 15, 1961-Aug. 30, 1966).
1961	One-year Coordination Agreement signed; renewed next year.
1961	Secretary Stewart Udall issues revised Federal Power Policy.
1962	Executive Order 10988 authorizes code of fair labor practices; improves collective bargaining in Federal service.
1962	(Aug. 20) BPA celebrates 25th anniversary.
1962	Columbus Day storm; BPA stiffens specifications to withstand high velocity winds.
1962	AEC Appropriation Act of 1963 authorizes AEC and BPA to contract for non-Federal construction and operation of steam-generating facilities at Hanford NPR.
1963	Hanford Exchange Agreements signed.
1963	Upper Snake River drainage area transferred, bringing entire American portion of Columbia River Basin into BPA service area.
1963	10-Year Coordination Agreement signed.
1963	D.C. test center to facilitate intertie studies placed in service at Big Eddy, Oregon.
1963	New Production Reactor at Hanford starts operating.
1963	BPA announces initiation of 500,000 volt overlay system.
1963	November 22, John F. Kennedy Assassinated.
1964	Cutback in plutonium production and retirement of eight older Hanford reactors announced.
1964	39-Year Coordination Agreement signed, effective January 4, 1965-June 30, 2003. Agreement covers only hydroelectric plants.
1964	Columbia Storage Power Exchange established; pays $254 million for Canadian Entitlement.
1964	Luce initiates "beautility" program to improve appearance of BPA facilities.
1964	Regional preference bill signed.
1964	Public Works Appropriation Bill of 1965 funds Federal portion of Pacific Northwest-Pacific Southwest Intertie.
1964	Protocol signed to implement Columbia River Treaty.
1965	Water Resources Planning Act passed; Pacific Northwest River Basin Commission replaces CBIAC.
1965	FPC approves BPA's first rate increase, about 3 percent.
1966	Authorization of Grand Coulee Third Powerhouse. Act includes irrigation basin account and power repayment plan.
1966	David S. Black appointed BPA Administrator (Aug. 31, 1966-July , 1967).
1966	BPA's 10-Year Advance Program issued.
1966	WPPSS generating plant at Hanford begins commercial operations.
1966	Joint Power Planning Council, composed of 109 public and private utilities and BPA, formed.
1967	Henry Richmond, appointed Acting Administrator July, becomes Administrator October 20; serves to November 30, 1972.
1967	Western Systems Coordinating Council formed.
1967	First a.c. intertie line in service; second in late 1968.

1967	Duncan Dam in Canada begins operating.
1967	Plans announced for Dittmer Control Center in Vancouver, Washington.
1967	BPA issues 20-year advance program.
1968	Wild and Scenic Rivers Act precludes hydro development on portions of Rogue, Salmon, and Clearwater rivers.
1968	Northwest utilities agree on Hydro-Thermal accord.
1969	Hydro-Thermal Power Program (Phase I) approved by President Nixon.
1969	Public Works Appropriation Act for fiscal year 1970 approves BPA's proposed net-billing procedure for implementing HTPP with respect to Trojan.
1970	Executive Order 11491 (Oct. 29, 1969) supercedes E.O. 10988; recognizes exclusively Columbia Power Annual Employees Council.
1970	800 kV d.c. line of intertie put into service.
1970	National Environmental Policy Act establishes Council on Environmental Quality.
1970	Public Works Appropriation Act for fiscal year 1971 applies net billing authority to 7 thermal plants proposed under Phase I, Hydro-Thermal Power Program.
1970	BPA's first Environmental Impact Statement published.
1970	Geothermal Steam Act paves way for leases on public lands for developing geothermal steam.
1971	BPA adopts more formal industrial sales policy in response to Public Power Council's concern over large sales to industry.
1971	Office of Management and Budget approves BPA wheeling for non-Federal plants built as part of Hydro-Thermal Power Program.
1971	First presidential message devoted entirely to energy delivered by President Nixon to Congress.
1971	BPA cumulative revenue passes $2 billion mark.
1972	Donald P. Hodel appointed BPA Administrator (Dec. 1, 1972-Dec. 31, 1977).
1972	Corps of Engineers issues reconnaisance report on pumped storage possibilities of Pacific Northwest.
1972	BPA establishes conservation office.
1973	B. C. Hydro completes Mica Dam.
1973	Nixon announces study of proposed 5-year $10 billion energy research and development program, headed by AEC chairman, Dr. Dixy Lee Ray.
1973	Arab-Israeli war leads to oil embargo by Arab countries; embargo lifted March, 1974.
1973	Dr. Ray's report lists conservation research as top priority; rcecognizes conservation as a long-term learning curve.
1973	BPA and utilities agree to Phase II, HTPP to extend through 1986, without net-billing.
1974	UHV Test Facility at Lyons, Oregon, authorized.
1974	Hodel sponsors BPA's first energy conservation management conference.
1974	Hodel presented Interior Department's Outstanding Service Award for prompt organization of energy conservation program in response to 1972-73 low water year.
1974	Wild and Scenic Rivers Act amended.
1974	Federal Energy Act establishes Federal Energy Administration.
1974	Energy Reorganization Act abolishes AEC; functions divided between Nuclear Regulatory Commission and Energy Research and Development Administration.
1974	Federal Columbia River Transmission System Act authorizes BPA to issue revenue bonds.
1974	Dittmer Control Center activated.
1975	BPA participation in Phase II, HTPP stopped by court challenges until completion of Environmental Impact Statement on BPA program.
1975	Energy Policy and Conservation Act aims at reducing dependence on foreign oil.

1975	First 600,000 kW generator in Third Powerhouse at Grand Coulee begins operating.
1975	FPC approves 27 percent BPA rate increase.
1975	Hells Canyon National Recreation Act deauthorizes Asotin Dam; creates Hells Canyon National Recreation Area, prohibiting hydro development through middle reach of Snake River.
1976	BPA issues notices of power insufficiency to meet load growth of preference customers beyond June 30, 1983.
1976	Teton Dam fails.
1976	Energy Conservation and Production Act extends life of FEA; increases incentives for energy conservation.
1976	Water Resources Development Act replaces River and Harbor and Flood Control Act, directs Corps of Engineers to restudy feasibility of nation's undeveloped water power.
1976	Final planning for additional 1.05 million kW for second powerhouse at McNary Dam authorized.
1977	WPPSS and ERDA agree to extend Hanford contract to June 30, 1983.
1977	President Carter gives energy conservation top priority in message to Congress; reflected in proposed National Energy Act.
1977	Aug. 20, BPA's 40th anniversary.
1977	UHV Test Facility at Lyon, Oregon, dedicated.
1977	Oct. 1, Department of Energy Organization Act transfers BPA from USDI to DOE. FPC becomes Federal Energy Regulatory Commission.
1977	Three bills on energy and conservation in the Pacific Northwest introduced in Congress: (1) "Pacific Northwest Electric Power Supply and Conservation Act of 1977," introduced in Congress at request of PNUCC; (2) Hulburt amendment; and (3) "The Columbia Basin Energy Corporation Act of 1977."
1977	Carter asks Corps of Engineers to study feasibility of adding generators at existing dams.
1978	Jan. 1, Sanford Sterling Munro becomes BPA Administrator.
1978	Nov. 10, President Carter signs National Energy Act (consists of five Acts).
1978	Pacific Northwest Electric Power Planning and Conservation Act introduced; hearings; no action; reintroduced in 1979.
1979	April 5 Introduction of S.885 and HR 3508 as the Pacific Northwest Electric Power Planning and Conservation Act for the purpose of assuring an efficient and adequate power supply. Passed Senate August 3.
1979	Dec. 20, BPA increases wholesale rates 88 percent.
1980	May 18, Eruption of Mt. St. Helens.

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